DOCUMENT RESUME

ED 237 141 JC 830 521

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TITLE	Develop and Implement a Competency-Based Education Program. Module CBE-1.
INSTITUTION	National Postsecondary Alliance, Columbus, OH.; Ohio State Univ., Columbus. National Center for Research in Vocational Education.
PUB DATE	80
NOTE	171p.; Also sponsored by the National Academy for Vocational Education.
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	Community Colleges; *Competency Based Education; Inservice Education; Learning Modules; *Program Development; Two Year Colleges

ABSTRACT

This module contains 11 sequential learning experiences designed to provide educators with background information and opportunities to develop plans for implementing competency-based education (CBE) programs within their institution. Following introductory material focusing on the organization and objectives of the module, resources required for its use, and key terms, the 11 units are presented. Each includes enabling objectives, activities to assist in objective fulfillment, and feedback devices. After completing the series, educators should be able to: (1) demonstrate knowledge of the essential elements and desirable characteristics of CBE programs; (2) determine how their institution should identify competencies for its occupational programs; (3) determine the best approach to providing materials for the institution; (4) determine how students and teachers will be oriented to new roles; (5) plan for the development and use of appropriate evaluation instruments and grading procedures; (6) determine program features best suited to the needs and characteristics of the institution and its students; (7) describe options most appropriate for the institution's mode of operation; (8) determine strategies for implementing a CBE program; (9) prepare a total plan for program implementation; (10) complete the workshop evaluation form and submit a copy of the CBE implementation plan; and (11) within their own institution, develop and implement a CBE instructional program. (LAL)

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ED237141

DEVELOP AND IMPLEMENT A COMPETENCY-BASED EDUCATION PROGRAM

Module CBE-1

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DEVELOPMENT SPONSORED BY

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Education Institutions/Districts
and
The National Academy for Vocational Education
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The National Center for Research in Vocational Education
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JC 830 521

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This module is dedicated to Karen M. Quinn, who will never be forgotten by those privileged to know her, and who did more **than her** share to promote CBE.

The work presented herein was performed by the National Center for Research in Vocational Education on behalf of the National Alliance of Postsecondary Education Institutions/Districts. Member districts supporting this development effort and the first workshop conducted at Durham, North Carolina on November 9-12, 1980 were as follows: Bergen Community College, Bergen, New Jersey; Caldwell Community College and Technical Institute, Hudson, North Carolina; Durham Technical Institute, Durham, North Carolina; Guildford Technical Institute, Jamestown, North Carolina; Mississippi Gulf Coast Junior College, Perkinston, Mississippi; State Fair Community College, Sedalia, Missouri; Trident Technical College, Charleston, South Carolina; and Williamsport Area Community College, Williamsport, Pennsylvania. The opinions expressed herein do not, however, necessarily reflect the position or policy of any of the sponsors, and no official endorsement by them should be inferred.

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INTRODUCTION

Competency-based education (CBE) is one of the most significant educational innovations that has surfaced within the last fifty years. CBE has been endorsed at the local, state, and national levels, and is also catching the attention of many international educators. CBE is a now rapidly growing and sustained movement, leading to the improvement of instruction.

CBE is an alternative to the conventional approach to instruction that has too often meant frustration and failure for too many students. CBE acknowledges and, in fact, capitalizes on the facilitation of effective and efficient learning, which is relevant to the real world of work, by employing the learning principles of motivation, individualization, reinforcement of learning, self-pacing, recognition of differing learning styles, provision of frequent feedback, opportunities for practice, and active participation.

CBE is being implemented at many levels (secondary, postsecondary, higher education, adult education) and for many populations (students, teachers, counselors, administrators, and others). Staff at the National Center are convinced of its merit and are continuing to conduct a number of research and development efforts designed to help individuals, educational institutions, and state departments implement CBE in their respective jurisdictions. States such as Florida, Kentucky, Virginia, New York, Pennsylvania, North Carolina, Illinois, and Michigan have given CBE their strongest possible endorsement.

This module has been specially prepared to help you and other interested vocational and technical educators take a closer look at the concepts of CBE, the steps involved in implementing CBE, and some of the alternative forms that CBE programs are taking. It will also provide you with some of the basic skills and knowledge that you and other members of your institution will need, should you accept the challenge to implement CBE within your own institution.

Module Structure and Use

Organization

This module contains an introduction and 11 sequential learning experiences. Overviews, which precede each learning experience, contain the objectives for each experience and a brief description of what the learning experience involves.

Two types of objectives form the basis of the learning experiences: a terminal objective and enabling objectives. The enabling objectives are designed to help you achieve the terminal objective. Each learning experience has activities to help you accomplish the objective, and, by use of the feedback devices provided, you should be able to determine if you have reached each objective.

The first ten learning experiences are designed to provide you with the needed background information and to give you opportunities to apply that information by developing plans for implementing CBE programs in your own institution. The final learning experience is designed to allow you to develop and implement a competency-based education program within your own institution.

Objectives

Terminal Objective: Within your own institution, develop and implement a competency-based education (CBE) instructional program. You will assess your performance, using the "Program Developer Performance Assessment Form," pp. 181-182. (Learning Experience XI)

Enabling Objectives:

1. Given information on the principles underlying CBE programs, demonstrate knowledge of the essential elements and desirable characteristics of such programs. (Learning Experience I)
2. After receiving information about alternative methods for identifying and/or verifying competencies, determine how your institution should identify competencies for its occupational programs. (Learning Experience II)

3. Given information on CBE materials, determine the most satisfactory approach to providing materials for your institution. (Learning Experience III)
4. Given presentations on the roles of the student and the teacher/instructor in a CBE program, determine how students and teachers/instructors in your institution will be oriented to these new roles. (Learning Experience IV)
5. Given information on CBE assessment procedures and devices, plan for the development and use of appropriate evaluation instruments and grading procedures within your institution. (Learning Experience V)
6. Given information describing alternative CBE instructional models, determine the program features best suited to the needs and characteristics of your institution and your students. (Learning Experience VI)
7. Given information about various CBE management and administrative options, describe the options most appropriate for your institution's mode of operation. (Learning Experience VII)
8. Given implementation guidelines, determine strategies for initiating the implementation of CBE at your institution. (Learning Experience VIII)
9. Based on the work you have completed in the first eight learning experiences, prepare a total plan for implementing a CBE program in your institution. (Learning Experience IX)
10. Given that the workshop is drawing to a close, complete a workshop evaluation form and any other remaining tasks, and submit a copy of your small group's institutional CBE implementation plan to a resource person. (Learning Experience X)

Resources

A list of the outside resources that supplement those contained within the module follows. Check with your resource person (1) to determine the availability and the location of these resources, (2) to locate additional references, and (3) to get assistance in setting up activities with peers. Your resource person should also be contacted if you have any difficulty with directions, or in assessing your progress at any time.

Learning Experience I

Required

- ONE OR MORE RESOURCE PERSONS to present information on the principles underlying competency-based education (CBE).
- AN ASSIGNED GROUP OF PEERS with whom you can discuss the principles of CBE.
- AN ASSIGNED GROUP OF PEERS with whom you can assess your institution's current and desired status relative to CBE.

Learning Experience II

Required

- ONE OR MORE RESOURCE PERSONS to present information on alternative competency identification/verification processes.
- AN ASSIGNED GROUP OF PEERS with whom you can plan how you will handle the competency verification process in your institution.

Learning Experience III

Required

- ONE OR MORE RESOURCE PERSONS to present information on CBE materials.
- AN ARRAY OF SAMPLE CBE MATERIALS that you can review and evaluate.
- AN ASSIGNED GROUP OF PEERS with whom you can meet to review and evaluate sample CBE materials.
- AN ASSIGNED GROUP OF PEERS whom whom you can plan how you will provide CBE materials in your institution.

Learning Experience IV

Required

- ONE OR MORE RESOURCE PERSONS to present information on the roles of the student and the teacher/instructor in a CBE program.
- A RESOURCE PERSON (1) to role-play a student whom you need to advise concerning CBE, or (2) to conduct a role-play of a student entrance interview that you can observe.
- AN ASSIGNED GROUP OF PEERS with whom you can plan how you will orient students and instructional staff at your institution to CBE.

Learning Experience V

Required

- ONE OR MORE RESOURCE PERSONS to present information on CBE assessment procedures and devices.
- AN ASSIGNED GROUP OF PEERS with whom you can plan what CBE assessment procedures you will use in your institution.

Optional

- A RESOURCE PERSON to lead the group in developing an assessment device for a given competency.

Learning Experience VI

Required

- ONE OR MORE RESOURCE PERSONS to present information on alternative CBE instructional models.
- AN ASSIGNED GROUP OF PEERS with whom you can plan the instructional model you will adopt at your institution.

Learning Experience VII

Required

- ONE OR MORE RESOURCE PERSONS to present information on various CBE management and administrative options.
- AN ASSIGNED GROUP OF PEERS with whom you can plan how you will manage and administer CBE in your institution.

Learning Experience VIII

Required

- ONE OR MORE RESOURCE PERSONS to present information on implementation guidelines.
- AN ASSIGNED GROUP OF PEERS with whom you can plan how you will initiate the implementation of CBE at your institution.

Learning Experience IX

Required

- AN ASSIGNED GROUP OF PEERS with whom you can compile a single tentative CBE implementation plan.

Learning Experience X

Required

- ONE OR MORE RESOURCE PERSONS to lead the group in completing the finishing-up activities for the workshop.

Learning Experience XI

Required

- AN ACTUAL SECONDARY OR POSTSECONDARY INSTITUTION in which you can develop and implement a competency-based education program.

Selected Terms

Administrator -- refers to a member of the secondary or postsecondary administrative team. This generic term, except where otherwise specified, refers to the community college president, vice-president, dean, or director; or to the secondary school principal, director, or superintendent.

Board -- refers to the secondary or postsecondary educational governing body. Except where otherwise specified, the term board is used to refer to a board of education and/or a board of trustees.

Competency -- refers to achievement of the knowledge, skills, and attitudes required to perform a given task.

Competency-Based Education -- refers to an approach to instruction in which the emphasis is on developing specified competencies rather than on just gaining knowledge of how to do something.

Institution -- refers to a secondary or postsecondary educational agency. Except where otherwise specified, this generic term is used to refer synonymously to secondary schools, secondary vocational schools, area vocational schools, community colleges, postsecondary vocational and technical schools, and trade schools.

Learning Package -- refers to the type of learning materials that are developed for most competency-based education programs and organized into modular form. Learning packages vary widely in form, length, and scope from program to program. Some consist of a one- or two-page outline, while others are comprehensive, self-contained instructional packages of fifty or more pages each.

Resource Person -- refers to the workshop staff and consultants.

Student -- refers to a person who is enrolled and receiving instruction in a secondary or postsecondary educational institution.

Teacher/Instructor -- these terms are used interchangeably to refer to the person who is teaching or instructing students in a secondary or postsecondary educational institution.

Learning Experience I

OVERVIEW

Enabling Objective

Given information on the principles underlying CBE programs, demonstrate knowledge of the essential elements and desirable characteristics of such programs.

Activity

You will be attending a large-group presentation on the principles underlying competency-based education (CBE). You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Competency-Based Education (CBE): Characteristics and Principles," pp. 11-23.

Activity

You will be participating in a small-group discussion concerning the principles of CBE, using the "CBE Related Questions for Thought," pp. 25-27, as a basis for the discussion.

continued

Feedback

You will be evaluating your knowledge of the essential elements and desirable characteristics of CBE programs by comparing your responses to the "CBE-Related Questions for Thought" with the responses given orally by your peers and/or resource person.

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," sections 1, 2, and 3a, pp. 29-30, which relate to your institution's current status and desired situation concerning CBE.

Feedback

You will be evaluating your group's competency in developing sections 1, 2, and 3a of the plan, using the "CBE Implementation Plan Checklist: Status and Goals," p. 31.

Activity

Attend a large-group presentation concerning the principles underlying CBE programs. This presentation will include the following topics:

- Need for CBE
- State of the scene in CBE
- Essential elements and desirable characteristics of CBE programs
- Elements of learning theory--the educational principles--that underlie effective CBE programs

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a written review of the material covered in the above presentation, you may wish to read the following information sheet.

COMPETENCY-BASED EDUCATION (CBE): CHARACTERISTICS AND PRINCIPLES

Essential Elements and Desirable Characteristics

Traditionally, in all of education, we have accepted the option of making *learning* the variable and *time* the constant. Whenever we say that a course involves so many hours of instruction, we are openly admitting our acceptance of this historical approach to education. A set number of hours per course is admittedly an administrative and planning convenience that is hard to give up. However, under these circumstances, our teaching is often geared to covering as much information as possible in the time permitted, in hopes that enough will be learned to allow our students to be successful.

Many persons feel it is about time that those of us involved in vocational and technical education should be opting to implement programs in which learning is the constant and time the variable. Vocational educators in many states, including New York, Kentucky, Florida, North Carolina, and Pennsylvania, are currently working hard to make this option a reality in their vocational and technical education programs through the implementation of competency-based education (CBE).

Before proceeding, it should be noted that terms and acronyms for these programs abound: CBE, PBE, CBSD, CBAE. What is important is that *all* such programs, regardless of the specific names attached to them, should possess the essential and desirable characteristics described below in order to be considered truly competency- or performance-based. Figures 1 and 2 are provided to familiarize you with some competency/performance-based terms and program features.

To understand fully the meaning of CBE, one must be aware of the essential elements and desirable characteristics[1] of such programs. There are five *essential elements*:

1. *Competencies to be achieved are carefully identified, verified, and made public in advance*--This simply means that the important entry-level competencies for any occupational program area must be identified in some appropriate manner, verified as relevant by experts who should know that field, and then made known to students and everyone else interested in what the program is designed to teach.
2. *Criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance*--This means we are going to eliminate guessing games about what parts of the course are important and tell students exactly how their performance will be evaluated. The implementation of this essential element also means that we are giving up the traditional norm-referenced approach to the evaluation of student achievement in which the focus is on comparing a student's progress with that of other students. In its place, we are adopting the criterion-referenced approach in which each individual student's progress is compared with previously established criteria that are made known to all who are concerned.

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[1] The essential elements and desirable characteristics presented here are adapted from *Achieving the Potential of Performance-Based Teacher Education: Recommendations*, PBTE Monograph Series: No. 16 (Washington, DC: American Association of Colleges for Teacher Education, 1974).

FIGURE 1

COMPETENCY/PERFORMANCE-BASED EDUCATION TERMS

Programs for Secondary and Postsecondary Students

CBE - Competency-based education
CBI - Competency-based instruction
PBI - Performance-based instruction
PBE - Performance-based education
CBVE - Competency-based vocational education

Programs for Teachers/Instructors in University Settings

PBTE - Performance-based teacher education
CBTE - Competency-based teacher education
PBVTE - Performance-based vocational teacher education
CBVTE - Competency-based vocational teacher education
C/PBTE - Competency/Performance-based teacher education
P/CBTE - Performance/Competency-based teacher education

Programs for Teachers/Instructors in Staff Development Settings

CBSD - Competency-based staff development
PBSD - Performance-based staff development

Programs for Administrators

CBAE - Competency-based administrator education
PBAE - Performance-based administrator education

Programs for Guidance Personnel

CBSD/GP - Competency-based staff development for guidance personnel

Programs for Adults

CBAE - Competency-based adult education

Occupational Analysis

DACUM - Developing A Curriculum - (a process for conducting an occupational analysis)

FIGURE 2

COMPETENCY/PERFORMANCE-BASED PROGRAMS ORGANIZER

Preferred Term	Other Commonly Used Terms	Essential Elements/Program Characteristics	Group(s) Referred To	Type of Competencies	NCRVE Materials	Planned Future Work by NCRVE
CBE COMPETENCY-BASED EDUCATION	CBI PBI PBE CBVE	THESE ARE THE SAME FOR ALL PROGRAMS AND GROUPS; in short: 1. COMPETENCIES ARE IDENTIFIED, VERIFIED, AND MADE PUBLIC 2. CRITERIA AND CONDITIONS FOR ASSESSMENT ARE SPECIFIED AND MADE PUBLIC 3. PROGRAM PROVIDES FOR THE INDIVIDUAL DEVELOPMENT OF COMPETENCIES 4. ASSESSMENT REQUIRES ACTUAL PERFORMANCE 5. STUDENTS PROGRESS AT THEIR OWN RATE	- Secondary, postsecondary, and adult vocational and technical students	- Technical and vocational skills - Sources include DACUM, V-TECS, curriculum labs - Ohio State T & I Instructional Materials Lab has about 120 occupational analyses	- Alliance for Career and Vocational Education has some materials - CETA/STIPP project has produced materials for eight occupational areas	- Development of 2-3 day workshop module - Development of 8-10 PBTE modules dealing with competencies teachers need
PBTE PERFORMANCE-BASED TEACHER EDUCATION	CBTE PBVTE CBVTE C/PBTE P/CBTE		- Preservice and inservice vocational teachers and instructors - Four-year college or university-based teacher education programs	- Professional (pedagogical) teaching skills - Several competency lists exist including NCRVE; 100 (based on Cotrell 384) - Hamilton et al. 380 special needs competencies	- 100 PBTE modules, 5 supporting documents, 3 slide/tapes, all published by AAVIM - Also available from NCRVE is a staff designed workshop module for training resource persons	- Development of approximately 16 modules for teachers working with special needs students - Development of 8-10 modules on implementing CBE - Workshops for training resource persons
CBSD COMPETENCY-BASED STAFF DEVELOPMENT			- Inservice vocational teachers and instructors - Staff development program operated in a secondary or two-year postsecondary agency; or in business/industry settings	Same as above	Same as above Workshop module for training resource persons CBSD implementation guide	- Workshops for training resource persons
CBAE COMPETENCY-BASED ADMINISTRATOR EDUCATION	NOTE: This may be confused with competency-based adult education		Secondary and postsecondary administrators of vocational and technical education programs	- Professional leadership and management skills - Several lists exist including Norton et al. 166	- 6 modules - 1 user's guide - 1 research report - 1 development report - Alternative Delivery Strategies Report - Annotated Bibliography of Instructional Materials	An additional 20-24 modules supported by a consortium of states: Florida, Illinois, Ohio, Pennsylvania, North Carolina, New York, Texas
CBSD/GP COMPETENCY-BASED STAFF DEVELOPMENT FOR GUIDANCE PERSONNEL			Career guidance personnal	Career guidance career development skills in 6 areas: planning, supporting, implementing, operating, evaluating, special populations	- 36 developmental draft modules in 6 categories - supportive materials including slide/tape presentation	Publication of the 36 modules and support materials including a slide/tape presentation
CBAE COMPETENCY-BASED ADULT EDUCATION	NOTE: This may be confused with competency-based administrator education		Adult education teachers/instructors		- Conference proceedings - Directory of programs - Program descriptions - Project final report	None at present

3. *The instructional program provides for the individual development and evaluation of each of the competencies specified*--What we are saying here is simply that each student shall be given the opportunity to develop each of the competencies important to his/her training program, and that each student will be given the opportunity to demonstrate attainment of each competency. This essential element has strong implications regarding the need to individualize CBE programs to the maximum extent possible and for the type of instructional materials needed to make individualization possible.

4. *Assessment of competency takes the students' knowledge and attitudes into account but requires actual performance of the competency as the primary source of evidence*--CBE goes beyond the traditional educational expectation that students should *know* the "how" and "why" of things and places a strong emphasis on the "ability to do" as well. Of course, in order to perform a task correctly, the student will need to acquire the necessary prerequisite knowledge and attitudes. Acquiring the necessary prerequisite knowledge and attitudes involved, however, does not by itself ensure the student's actual ability to perform important competencies. It is with regard to this essential element of CBE that many programs fall short, relying instead only upon paper-and-pencil tests of cognitive understanding as proof of competency. While such measures can appropriately be used to assess prerequisite knowledge, they must be supplemented by performance-oriented, process-and-product checklists or other measurement devices that permit assessment of the student's actual ability to perform the expected competencies.

5. *Students progress through the instructional program at their own rate by demonstrating the attainment of specified competencies*--Said in another way, we want to make time the variable and learning the constant. Again, it is clear that some individualization of instruction is called for. While student progress is dependent upon the demonstration of competencies, this element does not mean that reasonable time limits cannot be imposed upon the students. Some persons may want to interpret this element to mean that only the student is accountable for his/her progress. Not so--a CBE program places accountability for learning squarely upon the shoulders of both the learner and the instructor.

The additional desirable characteristics of CBE programs are as follows:

1. Instruction is individualized to the maximum extent possible, rather than group-paced.
2. Learning experiences are guided by frequent feedback.
3. Emphasis is on helping the student achieve program exit requirements.
4. Instruction is individually paced rather than time-based.
5. Instruction is, to a considerable extent, field-centered--based on realistic work problems and situations.
6. Instruction is often modularized and uses materials with both required and optional learning activities to help achieve flexibility and provide for different learning styles.
7. The program as a whole is carefully planned and systematic (e.g., concerned staff are involved in planning, and evaluation data is used for program improvement).

To help the reader visualize some of the major differences between a CBE program and a conventional program of vocational education, twelve factors related to each of the programs are presented below. Admittedly, few of today's programs would meet exactly the criteria for either type of program. While most actual programs are probably located somewhere between the two extremes, the comparison helps to summarize some of the basic differences inherent in the two approaches.

	Conventional Vocational Programs	Competency-Based Vocational Programs
1.	Content-Based	Competency-Based
2.	Time-Based	Performance-Based
3.	Group Paced	Individually Paced
4.	Group Needs	Individual Needs
5.	Delayed Feedback	Immediate Feedback
6.	Textbook/Workbook Materials	Modules and Media Materials
7.	Limited Field Experience	Learning in the Field
8.	Lectures, Demonstrations	Assistance of Resource Person
9.	General Objectives	Specific Objectives

	Conventional Vocational Programs	Competency-Based Vocational Programs
10.	Subjective Criteria	Objective Criteria
11.	Norm-Referenced	Criterion-Referenced
12.	Final Grades	Student Competence

Whether you are implementing your own CBE program, helping another teacher or instructor implement such a program, or in the position of evaluating programs implemented by others, some means of formative evaluation can be very helpful. With the essential elements and the desirable characteristics in mind, a Competency-Based Education Program Evaluation Checklist (see sample 1) has been devised to help you assess the status of any CBE program. It is recognized that different states and school systems have somewhat differing philosophies about what CBE is and, hence, the checklist may have to modified somewhat to fit local philosophies. Nevertheless, it is felt that the criteria listed reflect the minimum essential program elements that are generally recognized as necessary to assure overall program quality. It is hoped that the instrument can be used in a positive way to promote further the implementation of high-quality CBE programs that will better meet the vocational and technical education needs of our youth and adults.

The Educational Principles That Helped to Form Competency-Based Education

The rapidly increasing movement toward competency-based vocational education has come about because educators have done some serious rethinking about the assumptions on which vocational training is founded, how students learn, and what can be done to organize programs so more trainees can succeed in entering their chosen occupations. This rethinking has been influenced by recent research results that lead to the view that, given favorable learning conditions, *most people of the world can learn almost anything*. Combined with a systems approach to instruction, this *mastery learning* principle of instruction is having a powerful effect on contemporary vocational education.[2]

The variable time and content mastery aspect of competency-based education (CBE) is an extension and elaboration of the work of John Carroll in the 1960s and Benjamin Bloom in the

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[2] Some of the material in this section has been adapted from a presentation by William C. Knaak, Superintendent, 916 Vo/Tech Center, White Bear Lake, Minnesota.

SAMPLE 1

COMPETENCY-BASED EDUCATION PROGRAM EVALUATION CHECKLIST

Program ______________________

Name ______________________

Date ______________________

Directions: Indicate the extent to which the program being evaluated has implemented each of the following essential elements and desirable characteristics by checking the appropriate box under Level of Implementation.

	Level of Implementation			
	Poor	**Fair**	**Good**	**Excellent**
A. ESSENTIAL CHARACTERISTICS:				
1. Competencies to be achieved by the students have been:				
a. carefully identified	☐	☐	☐	☐
b. verified by local experts	☐	☐	☐	☐
c. made public	☐	☐	☐	☐
2. Criteria for assessing each of the verified competencies have been:				
a. derived from analysis of the competencies	☐	☐	☐	☐
b. explicitly stated along with conditions	☐	☐	☐	☐
c. made public	☐	☐	☐	☐
3. Instructional program provides for the:				
a. individual development of each competency	☐	☐	☐	☐
b. individual assessment of each competency	☐	☐	☐	☐
4. Assessment of the students' competency:				
a. takes knowledge into account	☐	☐	☐	☐
b. takes attitudes into account	☐	☐	☐	☐
c. requires actual performance of the competency as the major source of evidence	☐	☐	☐	☐
5. Students progress through the program:				
a. at their own rate	☐	☐	☐	☐
b. by demonstrating their competence	☐	☐	☐	☐
B. DESIRABLE CHARACTERISTICS				
6. Instruction is individualized to **the maximum extent** possible	☐	☐	☐	☐
7. Learning experiences are guided by frequent feedback	☐	☐	☐	☐
8. Emphasis is upon students' achievement of exit requirements	☐	☐	☐	☐
9. Instruction is individually paced rather than time-based	☐	☐	☐	☐
10. Instruction is field-centered using realistic work situations and actual on-the-job experiences	☐	☐	☐	☐
11. Instructional materials are:				
a. modularized	☐	☐	☐	☐
b. mediated	☐	☐	☐	☐
c. flexible with both required and optional learning activities provided	☐	☐	☐	☐
12. The instructional program as a whole is carefully planned and systematic—evaluation data is used for program improvement	☐	☐	☐	☐

Level of Implementation: In a fully implemented CBE program, all items will receive an excellent response. If any item receives a Poor or Fair response, you should meet with your competency-based education program coordinator to determine what changes are needed and how you can get help in making them.

early 1970s. In reporting his work, Bloom says that he has found three principles of learning that dominate educational thinking in the world. The first, and traditional, principle is as follows:

> There are good learners and there are poor learners.

This concept of learning has a long and honored tradition and is, even now, held by about 85 percent of the people of the world. In this view, the ability to learn is considered to be a relatively permanent trait of the individual. Individuals, it is said, possess different amounts of the ability to learn, and the amount is not apt to change over time. A quantitative index of learning ability can be derived by using appropriate tests of intelligence, aptitude, or achievement. Aptitude is directly correlated with achievement, so the notion goes, and a student's position on the normal curve of learning will probably remain fairly constant between the third grade and eleventh grade.

Based on this traditional principle of learning, the important task of the school is to teach those who can learn and weed out poor learners. Grading systems are built on this, and tracking systems are designed to make it administratively functional. Most students, parents, teachers, and administrators accept this idea, whether they actually think about it or not. In recent years, however, there has been a significant erosion of the traditional principle of learning.

During the early 1960s a great interest developed in the Carroll Model of School Learning, which says, in effect, the following:

> There are faster learners and there are slower learners.

It is not entirely clear whether rate of learning is considered a permanent trait, or whether it can be changed with instruction and practice. In any case, much effort has been expended in finding ways by which slower learners can be provided with the extra time and special help they need in order to attain the criteria of achievement. Individualization of instruction and open-entry/open-exit vocational programs are examples of the ways in which educators have sought to meet the needs of slower and more rapid learners.

In the research undertaken in educational laboratories and classrooms throughout the world, it has become evident that a large proportion of slower learners may ultimately learn specified content as well as faster learners. When slower learners do succeed in meeting the same criterion as faster learners, they also seem to be able to learn equally complex and abstract ideas, they can retain these ideas equally well, and they can apply the ideas to new problems--this in spite of the fact that they initially need more time and help to learn than others. Furthermore, slower learners' attitudes toward school subjects in which they attained achievement are just as positive as those of faster learners.

Perhaps about 14 percent of the people of the world now accept this concept of education. Recent research appears to strengthen the idea, but at the same time it is being superceded by a more comprehensive principle championed by Benjamin Bloom--one that brings us still closer to competency-based vocational instruction.

During the past decade or so, Bloom and his students have done research that has given us a different view of the potential of students. Bloom's mastery learning principle contends the following:

> Most students become very similar with regard to learning ability, rate of learning, and motivation for further learning--when provided with favorable learning conditions.

This research seriously questions the first two principles concerning permanence of good and poor learning ability, and fast and slow learning characteristics. In mastery learning experiments, students who did achieve mastery of the material in a block of instruction proceeded to the next block. Students who did not achieve mastery the first time received additional learning treatments. Research results demonstrated that (1) students become more alike in their learning rate as they proceed in a mastery learning situation, (2) 80 to 95 percent of students can achieve mastery if they have mastered prerequisite knowledge and skills, and (3) mastery students increasingly apply themselves to learning (reaching the 85- to 90-percent level) while students in traditional settings dropped to 40 percent in application to learning.

The term favorable learning conditions in mastery learning is, of course, the crucial element. This may include extra time, additional instruction, a variety of instructional media, and field-based learning experiences, among other things.

All of this has far-reaching implications for teacher training, classroom and laboratory instruction, grading procedures, how schools are organized, and the development of new vocational curricula. It means that schools should provide for a variety of student learning styles and rates, that students should demonstrate competence in one skill before moving on to another, and that teachers must be able to deal with students as individual learners rather than as members of a group. It also implies that subject-matter content must be carefully defined and organized. In short, it leads to an instructional program like that espoused by proponents of competency-based education.

Related to the educational principles previously mentioned are several psychological (learning theory) bases for self-paced learning, which is one of the essential elements of CBE programs. These psychological bases were recently articulated by the Faculty and Instructional Development Office of San Jose State University, San Jose, California, as follows:

> Self-paced learning methods are ways of improving instructional programs. There are a number of psychological reasons that support this success. They include the following:
>
> 1. Students need structure and direction for their study--For some students, being informed of the objectives for their study reveals only the requirements. Others are able to see the broader significance of the study they will pursue.
> 2. Students learn at different rates--Learning experiences should be designed so that each student may proceed at his own pace and possibly on his own ability level, using materials that are most appropraite for him or her.
> 3. Students' interests and motivation vary--All students are neither ready for studying a topic at the same time, nor does each one want to learn the same content at the same time.
> 4. For best results, content should be sequenced and handled in small amounts--Students can acquire more information and retain it longer when they see that the content is systematically organized and presented to them as separate concepts that build toward principles and problem-solving.
> 5. Learning requires active articipation--Learning is an activity and must be performed by the student and not by the teacher through some kind of transmission process. One of the instructor's main functions is to organize and make content available to students in the best possible form.

6. Learning should be successful for continued learning to take place--When a student experiences success, he/she will also experience satisfaction and be motivated to continue the efforts to learn. This requires opportunities for the student to test his/her understanding and application of knowledge and skills, and to be informed of his/her success or need for improvement.

Vocational programs that are based on the rigorous identification of occupational skills (competencies), individualized (to the maximum extent possible) and time-free instruction, and student mastery of each competency, show many clear advantages over conventional programs. The advantages are not easily realized, however, nor are they automatic or inevitable. Among the most important educational (as opposed to management) reasons for CBE are the following:

- The learner progresses at his/her own best rate to achieve occupational skills.
- More learners achieve competence than is possible in group-centered instruction.
- Learners may achieve competence in a shorter period of time.
- The learner builds self-confidence and self-esteem by succeeding in learning.
- Students learn to help each other rather than compete for grades.
- The content of instruction is well organized and consistent.
- The final product (the entry-level worker) is more uniform in basic skills and abilities.
- Students can learn according to their preferred learning styles.

School and college occupational programs designed to capitalize on the educational advantages of CBE find that there are also very significant administrative and management benefits to this approach. In fact, it can be argued that the management reasons for CBE are in themselves justification enough. Among the most important of these reasons are the following:

- Students are not required to repeat learning of skills previously acquired.
- Students can obtain ready access to instructional programs.

- Students with a wide range of entry-level skills can be accommodated.
- Programs are readily revised and kept current.
- The instructional staff can be utilized more efficiently.
- Facilities can be utilized more fully and efficiently.
- The placement of graduates in jobs is facilitated.
- Handicapped students can complete the segments of an instructional program that they are able to do.

Activity

Break up into your assigned small groups, and discuss the principles of CBE, using the following "CBE-Related Questions for Thought" as a basis.[3] It is suggested that you consider one section of statements (e.g., section A) at a time. Do all members of the group agree with the items in that section? Why or why not? How will that affect your approach to CBE?

CBE-RELATED QUESTIONS FOR THOUGHT

A. Is it all right for a learner to do the following:

1. Begin learning at a time of his/her choosing.
2. Complete learning at an undetermined time.
3. Work at his/her own pace.
4. Study what he/she wants to study.
5. Be actively involved in setting his/her own objectives.
6. Learn in a field-based (real) environment.
7. Accept more responsibility for learning.
8. Take advantage of his/her personal learning style.
9. Actively participate in the evaluation of his/her progress.

---

[3] Adapted from a list developed by James Pollard, Spokane Community College, Spokane, Washington.

B. Is it all right for a learner NOT to do the following:

1. Study in the same manner as other students in the same program.
2. Use the same material for learning as other students.
3. Use the same learning experiences as others.
4. Progress at the same rate as others in his/her class.

C. Is it all right for an instructor to do the following:

1. Teach the same subject in a different way from one quarter to the next.
2. Use different learning activities for different students.
3. Work with students in small groups and individually.
4. Assign out-of-class activities instead of requiring classroom attendance.
5. Use media to present information.
6. Assist students in self-evaluation rather than critiquing paper-and-pencil assignments.
7. Ask learners how they feel they did rather than simply assigning letter grades.
8. Hold learners accountable for the mastery of specific tasks or skills rather than assigning normative scores based on paper-and-pencil examinations.

9. Expect the learner to accept more responsibility for learning.

10. Use to advantage the individual cognitive learning skills of students.

11. Allow learners to choose some electives from a list of competencies rather than having them complete only predetermined objectives.

12. Prepare learning plans that help students learn rather than preparing lesson plans that help teachers teach.

13. Be available when the student needs the instructor rather than requiring the students to be in attendance when the instructor is scheduled to teach.

D. Is it all right for an instructor NOT to do the following:

1. Rely primarily on lectures as a method of instruction.

2. Expect every student to achieve the same skills in the same class.

3. Expect all students to achieve at the same rate.

4. Assign grades before the students have demonstrated competence.

Feedback

There is no formal feedback device for this activity. Your understanding of the principles underlying CBE and their importance should have been demonstrated through your participation during the discussion of the "CBE-Related Questions for Thought." If you are still unclear about any of these principles, you may wish to review the information sheet provided as an optional activity within this learning experience.

Activity

Join the other members of your assigned small group, and work together to develop the following sections of the "CBE Implementation Plan." In planning to develop and implement a CBE program in your own institution, you will be working with the same small group throughout this module. It is suggested that you appoint a recorder for your group, who will be responsible for ensuring that, as you discuss each of the following topics and questions, key points and decisions are documented on the planning document. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

1. Present Situation: Briefly outline the current status of CBE implementation efforts at your institution.
   - What specific positions have the board or administration taken in regard to CBE?
   - What, if any, programs are already totally or partially competency-based?
   - What CBE activities, if any, have been planned or conducted?

2. Desired Situation: Indicate any specific goals or objectives for the improvement of instruction that have already been established.

   - Is funding and staff available to facilitate change?
   - Are there any known constraints or concerns that may impede change? If so, what are they?

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   a. Essential Elements and Desirable Characteristics of CBE: Review the five essential elements of CBE and the associated desirable characteristics.

      - Can your institution accept each of these **CBE features?**
      - What, if any, features would have to be deleted or modified for your institute? Why? What implications does this have for the quality of your CBE program?

Feedback

After your group **has completed the previous** sections of the implementation plan, use the "CBE Implementation Plan Checklist: Status and Goals," p. 31, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: STATUS AND GOALS

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

In describing your institution's current status and desired situation concerning CBE, you:

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
1. were able to identify how the board and administration regard CBE........				
2. described CBE programs and activities already planned or underway.....				
3. were able to identify funds available to implement CBE................				
4. were able to identify staff available to implement CBE................				
5. were able to identify known constraints or concerns.................				
6. noted any CBE features that would have to be deleted or modified for your institution....................				
7. considered carefully how these deletions or modifications would affect the quality of your CBE program......				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience II

OVERVIEW

Enabling Objective	After receiving information about alternative methods for identifying and/or verifying competencies, determine how your institution should identify competencies for its occupational programs.
Activity	You will be attending a large-group presentation on alternative competency identification/verification processes. You will also have the opportunity to participate in a question-and-answer session following the presentation.
Optional Activity	You may wish to read the information sheet, "Identifying and Verifying Occupational Competencies," pp. 35-46.
Activity	You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3b, p. 47, which relates to how you will handle the competency identification process in your institution.
Feedback	You will be evaluating your group's competency in developing section 3b of the plan, using the "CBE Implementation Plan Checklist: Competencies," pp. 49-50.

Activity

Attend a large-group presentation concerning alternative methods for identifying and/or verifying competencies. This presentation will include the following topics:

- Traditional competency identification methods
- Other methods, e.g., DACUM
- Importance of verification
- Verification methods
- Sources of existing competency lists

Workshop participants with experience in identifying and/or verifying competencies may be asked to share their experiences with the group. The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a summary of information concerning the competency identification/verification process, including addresses for sources of existing competency lists, you may wish to read the following information sheet.[4]

IDENTIFYING AND VERIFYING OCCUPATIONAL COMPETENCIES

Since the first essential element of any competency-based education (CBE) program involves carefully identifying, verifying, and making public the competencies that are important to the occupational area of concern, it is necessary to be familiar with the alternative methods available for conducting an occupational analysis. Basically, an occupational analysis is a listing of all the tasks (skill statements or competencies) that make up a particular job, and that are necessary for proficiency in a given occupation. Logically, if students are to be taught to be employable keypunch operators, for example, you first must identify what being a successful keypunch operator involves in terms of the competencies required.

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4. Adapted from Direct Curriculum Development, a Competency-Based Administrator Module (Columbus, OH: The National Center for Research in Vocational Education, 1981), pp. 16-27.

As a member of your CBE implementation team, you can assist in acquiring the necessary occupational analyses. To locate appropriate existing occupational analyses, you need to be aware of such potential sources as the following:

Resources in Vocational Education (RIVE). Produced by the ERIC Clearinghouse on Adult, Career, and Vocational Education at The Ohio State University in Columbus, Ohio, this is a bimonthly publication that provides indexes to, and summaries of, a variety of instructional and research materials, including recently developed occupational analyses.

State curriculum laboratories. Many states have one or more curriculum laboratories or instructional materials centers that are supported through state department of education funding and/or through membership subscription fees. Some states, such as Ohio, have separate labs for agricultural education, distributive education, and trade and industrial education, while other states have only one lab or center serving all vocational education service areas. Many of these curriculum labs and centers have developed and published occupational (task) analyses. The Ohio State University's Trade and Industrial Education Instructional Materials Laboratory, for example, has released analyses for over 100 occupational areas. Similarly, Colorado State University's Curriculum Materials Service has produced over 30 occupational analyses that are available for purchase.

A number of states have developed a centralized approach to curriculum development (e.g., New York State's Instructional Support System for Occupational Education [ISSOE], and Kentucky's competency-based vocational education [CBVE] curriculum) that results in a standard, base, or core curriculum that is recommended for use by the institutions in that state. Before beginning a local curriculum development effort, it is advisable to check the status of existing state or regional efforts.

Regional and national consortiums. In recent years a number of regional and national consortiums have been organized and supported by various states and/or individual institutions to fund the development of occupational analyses and/or curriculum materials. Three such consortiums are as follows:

- Vocational-Technical Education Consortium of States (V-TECS)--V-TECS is a consortium of some 17 states (mostly in the Southeast) joined together to conduct occupational analyses and to publish them in the form of catalogs. An occupational catalog consists of the duty areas, task statements, learning guides, and criterion-referenced measures for each task. As of this writing there are over 70 catalogs that you may obtain (if your state is a member of V-TECS) from your state department of education.

Nonmember states can purchase the catalogs from V-TECS; 795 Peach Tree Street, NE; Atlanta, GA 30308.

- *Interstate Distributive Education Curriculum Consortium (IDECC)*--IDECC is a consortium of states that started in 1972 to develop a competency-based learning system based on task analysis for 69 occupations in marketing and distribution. The consortium sponsored the development of 500 learning activity packages (LAPs), containing 983 competencies and over 2,000 behavioral objectives, and is continuing to develop more competencies based on occupational analyses for additional occupations. The IDECC office is located at The Ohio State University; 1166 Chesapeake Avenue; Columbus, OH 43212.
- *Mid-America Vocational Curriculum Consortium (MAVCC)*--This consortium of 11 states produces vocational instructional materials in a wide range of occupational areas. The format of the materials is uniform throughout and has been designed to satisfy the needs of all member states. Each curriculum manual has a teacher edition. The materials are available to member states (at special prices) and nonmember states from Mid-America Vocational Curriculum Consortium, Inc.; 1515 West Sixth Avenue; Stillwater, OK 74074.

Regional Curriculum Coordination Centers. Supported by the U.S. Office of Education are six regional curriculum coordination centers. These centers maintain libraries of curricular materials, including occupational analyses, and also have reference documents that might help locate occupational analyses available elsewhere. Inquiries should be sent to the center serving your state as follows:

EAST CENTRAL NETWORK CURRICULUM COORDINATION CENTER
Delaware, District of Columbia, Illinois, Indiana, Maryland, Michigan, Minnesota, Ohio, Pennsylvania, Virginia, West Virginia, Wisconsin

Illinois Office of Education
Division of Ad. Vocational and Technical Education (E 426)
100 North First Street
Springfield, IL 62777
(217) 782-0758

MIDWEST NETWORK CURRICULUM COORDINATION CENTER
Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, Texas

State Department of Vocational and Technical Education
1515 West Sixth Avenue
Stillwater, OK 74074
(405) 377-2000, ext. 261

NORTHEAST NETWORK CURRICULUM COORDINATION CENTER
Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, Vermont, Virgin Islands

Bureau of Occupational and Career Research Development
Division of Vocational Education
225 West State Street
Trenton, NJ 08625
(609) 292-6562

NORTHWESTERN NETWORK CURRICULUM COORDINATION CENTER
Alaska, Colorado, Idaho, Montana, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming

Washington State Commission for Vocational Education
Building 17, Airdustrial Park
Olympia, WA 98504
(206) 753-0879

SOUTHEAST NETWORK CURRICULUM COORDINATION CENTER
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

Associate Dean (R & D) College of Education
Mississippi State University
Drawer DX
Mississippi State, MS 39762
(601) 325-2510

WESTERN CURRICULUM COORDINATION CENTER
American Samoa, Arizona, California, Guam, Hawaii, Nevada, Trust Territories of the Pacific Islands

University of Hawaii
1776 University Avenue
Honolulu, HI 96822
(808) 948-7834

In addition, within your own individual state, certain occupational analyses may have been developed in a particular school district, university, professional and technical association, labor organization, potential employer, federal or state government bureau, manufacturer's association, business or commerce institution, research or consulting firm, etc.

As a program developer, it may be up to you to identify all relevant sources, or to ensure that this is done by someone else. You may also need to facilitate the acquisition of all relevant documents. In most cases, this will require that funds are available to purchase the documents needed.

If, after identifying and tapping all existing sources, you determine that an occupational analysis does not exist for the area in question, then an occupational analysis will need to be completed. Your institution may be able to arrange to have this done by the state department of education staff, the vocational education staff at a local university, or may arrange to share the development costs and responsibilities with other local educational agencies, or the burden may fall on your staff. If the latter is true, funds will need to be set aside for the completion of the following first steps in an occupational analysis:

1. Define the scope of the analysis.
2. Prepare an initial task listing.

The occupational analysis starts with a general description of the occupation to be analyzed--drawn perhaps from the Dictionary of Occupational Titles (DOT)--and ends with a list of the general areas of responsibility (duties or functions), each further broken down into the specific skills (tasks) required. A partial occupational analysis is shown in sample 2.

Another occupational analysis procedure you should be aware of is DACUM (Developing A Curriculum). Developed by the Experimental Projects Branch, Canada Department of Regional Economic Expansion, and the General Learning Corporation of New York, DACUM uses small-group brainstorming techniques during a three-day meeting of 8-12 occupational area experts to generate a skill profile for a particular job or occupational area (see sample 3). Compared to the usual occupational analysis process, DACUM has proven to be a far more cost-effective and expeditious method for developing an occupational analysis.

An organization called the DACUM Chart Exchange (DEX) is a clearinghouse for both information on DACUM and available DACUM charts for given occupations. By contacting DEX, you can get a listing of all available charts at no charge. Each chart you then wish to order costs a nominal fee (approximately $2.00). The address for DEX is DACUM Chart Exchange (DEX); Humber College, Lakeshore Campus; 3199 Lakeshore Boulevard West; Toronto, Ontario; Canada M8V 1K8. Note that while DACUM charts done at other institutions may be quite helpful to you, it is highly desirable that each institution go through the process of verifying these charts locally or developing its own charts. This will ensure that local conditions and needs are met, and that the institution's instructional personnel will feel "ownership" of its own program.

In reading the DACUM chart shown in sample 3, notice that the general categories of competencies (duties) are given in the left-hand column. The specific competencies that are included in

SAMPLE 2

OCCUPATIONAL ANALYSIS
GENERAL SECRETARIES

Duty: Organizing and Planning Activities

Tasks: Assign specific work to individuals.
Compile periodic reports.
Compose copy at the typewriter.
Handle service calls on equipment.
Etc.

Duty: Personal Activities for Employer

Tasks: Acknowledge letters of congratulations.
Confer with employer on policy.
Keep list of credit card numbers.
Keep personal business diary for employer.
Etc.

Duty: Reception Activities

Tasks: Greet callers or visitors.
Maintain record of long distance calls.
Place telephone calls.
Screen employer's calls.
Etc.

Duty: Clerical Activities

Tasks: Assemble and staple duplicated materials.
Edit manuscripts.
Make corrections on original and carbon copies.
Type business letters.
Etc.

SOURCE: Adapted from Harry L. Ammerman and Duane W. Essex, Performance Content for Job Training, Volume 4: Deriving Performance Requirements for Training (Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977), pp. 76-83.

SAMPLE 3

OFFICE CLERICAL EMPLOYEE
ENTRY-LEVEL

Duties	Tasks							
OPERATING TYPEWRITERS	DETERMINE APPROPRIATE STATIONERY 2.30	CORRECT ERRORS 3.55	MAKE CARBON COPIES 2.50	PLACE MATERIALS IN TYPEWRITERS ACCURATELY 2.35	DETERMINE APPROPRIATE TYPEWRITTEN FORMATS 3.05	TYPE DOCUMENTS ACCURATELY 3.75	TYPE DOCUMENTS FROM ROUGH DRAFTS 2.65	TYPE TABLES 1.75
	ADDRESS MATERIALS FOR MAILING 3.50	PERFORM OPERATOR MAINTENANCE 1.60	UTILIZE TYPEWRITER ACCESSORIES 2.05	PROOFREAD WORKS 3.60	USE REFERENCE MATERIALS 2.65	REVISE FORMS 1.85		
COMMUNICATING WITH OTHERS	EXPRESS ONESELF 3.05	UTILIZE APPROPRIATE COMMUNICATION METHODS 3.10	ADHERE TO ESTABLISHED COMMUNICATION LINES 2.75	EXERCISE TACT AND DIPLOMACY 3.40	BE AN ACTIVE LISTENER 3.65	UTILIZE BUSINESS DECORUM 2.45	ASK QUESTIONS WHEN NECESSARY 3.60	COMMUNICATE ON ONE-TO-ONE BASES 3.15
USING TELEPHONES	USE PROPER TELEPHONE TECHNIQUES 3.20	TRANSFER CALLS 3.60	SET UP CONFERENCE CALLS 1.65	SCREEN CALLS 2.10	PLACE LOCAL AND LONG DISTANCE CALLS 2.20	RECORD TELEPHONE MESSAGES 3.30	DISTRIBUTE TELEPHONE MESSAGES 2.65	UTILIZE AVAILABLE INFORMATION RESOURCES 2.75
PROCESSING MAIL	SORT INCOMING MAIL 2.30	IDENTIFY MAIL TO BE OPENED 2.35	OPEN MAIL PROPERLY 1.90	DATE MAIL 2.30	MAINTAIN CURRENT MAILING LISTS 2.45	INSURE ATTACHMENTS TO INCOMING MAIL 2.60	NOTE ABSENCE OF ATTACHMENTS 2.50	DISTRIBUTE MAIL 2.40
	UTILIZE POSTAL SERVICES 2.55	UTILIZE AVAILABLE RESOURCE MATERIALS 2.65						
REPRODUCING MATERIALS	DETERMINE NUMBERS OF COPIES REQUIRED 2.55	REPLACE PAPER IN MACHINES 2.50	DETECT MACHINE MALFUNCTIONS 2.55	TAKE APPROPRIATE MEASURES TO CORRECT MACHINE MALFUNCTIONS 2.65	FULLY UTILIZE MACHINE CAPABILITIES 2.90	IDENTIFY ALTERNATIVE REPRODUCTION SOURCES 2.45	PRACTICE REPRODUCTION ECONOMY 2.90	DETERMINE DEADLINES FOR COPYING MATERIALS 2.85
	PERFORM CUT-AND-PASTE TECHNIQUES 1.50	MAINTAIN ADEQUATE LEVELS OF REPRODUCTION SUPPLIES 2.10	MAINTAIN COPY LOGS 1.85					
CONTROLLING DOCUMENTS	USE EXISTING FILING SYSTEMS 3.20	RETRIEVE MATERIALS 2.90	MAINTAIN FILE CHECKOUT SYSTEMS 3.50	MAINTAIN LOGS OF MATERIALS 1.90	ADHERE TO ESTABLISHED SECURITY STANDARDS 2.95	INSURE COMPLETENESS OF FILES 3.15	PREPARE DOCUMENTS FOR FILING 3.05	MAINTAIN FILING INDEXES 2.20
OPERATING OFFICE MACHINES	DETERMINE AVAILABILITY OF MACHINES 2.30	SECURE OPERATING INFORMATION 2.45	OPERATE 10-KEY ADDING MACHINES 3.05	OPERATE SPECIAL EQUIPMENT SUCH AS KEYPUNCHES, WORD PROCESSORS AND TELECOPIERS 1.90	USE APPROPRIATE POSTAL SCALES 2.50	USE RECORDING DEVICES 1.85	USE TRANSCRIBING EQUIPMENT 1.95	USE SPECIALIZED TELEPHONE EQUIPMENT 1.65
APPLYING BUSINESS MATHEMATICS	PERFORM BASIC MATHEMATICAL COMPUTATIONS 3.40	CALCULATE DISCOUNTS 2.55	USE CONVERSION TECHNIQUES 2.10	MAKE CORRECT CHANGE 3.35	RECONCILE BANK STATEMENTS 2.85	PREPARE DEPOSITS 3.35	MAINTAIN PETTY CASH FUNDS 2.70	MAINTAIN CHECK REGISTERS 3.15
	USE PROPER POSTING TECHNIQUES 3.15	CALCULATE SPECIAL PAYROLL DEDUCTIONS 2.25	COMPLY WITH ESTABLISHED COLLECTION POLICIES 2.50					
APPLYING BUSINESS LANGUAGES	SPELL WORDS CORRECTLY 3.55	USE ACCEPTABLE PUNCTUATION 3.40	USE CORRECT GRAMMAR 3.50	USE PROPER SENTENCE STRUCTURE 3.80	COMPOSE ROUTINE CORRESPONDENCE 3.00	APPLY APPROPRIATE BUSINESS TERMINOLOGY 3.05	USE DICTIONARIES EFFECTIVELY 3.20	USE REFERENCE MATERIALS 3.40
ADAPTING TO BUSINESS ENVIRONMENTS	ADHERE TO SAFETY REGULATIONS 2.75	BE RECEPTIVE TO CHANGES 3.25	FOLLOW INSTRUCTIONS 3.45	INTERACT WITH CO-WORKERS 2.95	ADHERE TO ESTABLISHED DRESS CODES 2.65	PROJECT ACCEPTABLE PUBLIC IMAGES 2.95	DETERMINE PRIORITIES 3.20	ASSUME RESPONSIBILITIES 3.45
PROMOTING PERSONAL GROWTH AND DEVELOPMENT	APPRISE ONESELF OF EMPLOYMENT BENEFITS 2.65	RECOGNIZE ADVANTAGES OF CONTINUED EDUCATION 2.95	BE OBSERVANT 3.25	SEEK ADVICE 3.40	EXERCISE INITIATIVE 3.60	PRACTICE ACCEPTABLE PERSONAL HYGIENE 3.50	RECOGNIZE VALUE OF COMMUNITY SERVICES 2.75	SEEK ADDED RESPONSIBILITIES 2.95

RATING SCALE

0--Irrelevant or not important

1--Little importance

2--Average importance

3--Very important

4--Critical importance

SOURCE: DACUM chart from Sandra Boland et al., Occupational Analysis: Office Clerical Employee Entry-Level (Fort Collins, CO: Colorado State University, Division of Vocational Education, Curriculum Materials Service, 1978), pp. 7-8.

Tasks

TYPE REPORTS AND MANUSCRIPTS 2.10	TYPE MINUTES OF MEETINGS 1.65	TYPE MEMORANDUMS 1.65	TYPE DOCUMENTS FROM AUDIO SOURCES 1.60	TYPE DRAFTS 1.75	TYPE LABELS 1.75	TYPE LETTERS 3.10	PLACE DATA ON FORMS CORRECTLY 3.35	DETECT OBVIOUS ERRORS IN TEXTS 3.35	TYPE STATISTICAL DATA 3.95
BE OPEN TO SUGGESTIONS 3.60	ACCEPT CONSTRUCTIVE CRITICISMS 3.40	CRITICIZE OTHERS IN A CONSTRUCTIVE MANNER 2.70	RELATE IN POSITIVE MANNERS 3.40	DETERMINE NEED FOR COMMUNICATIONS 2.80	DETERMINE PROPER LEVELS OF COMMUNICATIONS 2.70	MAINTAIN A SENSE OF HUMOR 2.80	COMMUNICATE ORALLY WITH OTHERS 3.15	ADHERE TO PROTOCOL 1.95	
MAINTAIN LISTINGS OF FREQUENTLY USED NUMBERS 2.60	PRACTICE TELEPHONE ECONOMY 2.60	LOG ALL TOLL CALLS 1.75	MONITOR HOLDING CALLS 2.45	MAINTAIN COMPOSURE UNDER PRESSURE 3.15	DETECT AND REPORT EQUIPMENT MALFUNCTIONS 2.60	UTILIZE INTERCOM SYSTEMS 2.00	GATHER DATA BEFORE PLACING CALLS 3.15	SHOW WHEREABOUTS OF PERSONNEL 3.45	LEAVE INFORMATIVE MESSAGES 2.85
PROCESS SPECIAL MAIL 2.50	MAINTAIN MAIL LOGS 1.50	CLASSIFY MAIL 1.60	DETERMINE PROPER POSTAGE 2.45	SECURE PROPER ATTACHMENTS TO OUTGOING MAIL 2.75	DETERMINE COMPLETENESS OF MATERIALS TO BE RELEASED 3.10	DISTRIBUTE CARBON COPIES 2.55	SORT OUTGOING MAIL 2.05	ADHERE TO MAILING DEADLINES 2.95	MAINTAIN ADEQUATE POSTAGE RESOURCES 3.30
ASSEMBLE MATERIALS 2.85	UTILIZE REPRODUCTION ACCESSORIES 2.35	DETERMINE DISTRIBUTION REQUIREMENTS 2.35	DISTRIBUTE COMPLETED COPIES 2.95	PROCESS SPECIAL DOCUMENTS 3.20	ACCOUNT FOR ALL ORIGINALS 3.35	RETURN ORIGINAL MATERIALS TO SOURCES 3.20	LEAVE COPYING AREAS IN ORDER 2.75	CHECK QUALITY OF COPIES 2.95	STORE MATERIALS FOR REUSE 2.25
CROSS-REFERENCE MATERIALS 2.05	ESTABLISH PROPER FILE SIZES 2.10	DETERMINE EQUIPMENT NEEDS 2.15	PURGE FILES 2.10	DISPOSE OF MATERIALS 2.35	ASSEMBLE FILES 3.10	CATEGORIZE MATERIALS 2.40	SORT MATERIALS 2.40		
USE AUDIOVISUAL EQUIPMENT 1.55	USE HOLE PUNCHES 2.10	PERFORM ROUTINE OPERATOR MAINTENANCE 2.40	OPERATE AUTOMATED ACCESSORIES SUCH AS ELECTRIC PENCIL SHARPENERS AND LETTER OPENERS 1.90	MAINTAIN INVENTORIES OF SUPPLIES 2.45	EXERCISE SAFETY PRECAUTIONS 2.70	DETECT MACHINE MALFUNCTIONS 2.55	TAKE APPROPRIATE MEASURES TO CORRECT MACHINE MALFUNCTIONS 2.30		
ISSUE RECEIPTS 3.30	POST FINANCIAL TRANSACTIONS 2.90	VERIFY COMPUTATIONS 3.25	PROCESS EXPENSE VOUCHERS 2.30	VERIFY RECEIVED MATERIALS 2.95	REPORT OBVIOUS DISCREPANCIES 3.50	CALCULATE INTEREST 2.35	MAINTAIN INVENTORY CONTROLS 2.55	MAINTAIN TIMEKEEPING RECORDS 2.25	USE TAX TABLES [illegible]
PROOFREAD MATERIALS 3.50	COMMUNICATE WITH OTHERS THROUGH WRITTEN MEDIA 3.05	RESTRUCTURE COPIES WHEN NECESSARY 2.95	BE CONCISE 3.15						
PERFORM WORK UNDER PRESSURE 3.45	ADHERE TO OFFICE POLICIES 2.80	ADHERE TO OFFICE REGULATIONS 2.95	MAINTAIN ORDERLY WORK STATIONS 2.95	ASSIST IN KEEPING OFFICES NEAT 2.95	PERFORM WORK WITHIN ORGANIZATIONAL STRUCTURE 2.85	ORIENT ONESELF TO SURROUNDINGS 2.80	SEEK CLARIFICATIONS OF JOB ASSIGNMENTS 2.95	EXERCISE DISCRETION 3.00	
RECOGNIZE PERSONAL STRENGTHS 2.95	RECOGNIZE PERSONAL WEAKNESSES 3.20	SET REALISTIC GOALS 3.15	PROJECT POSITIVE ATTITUDES 3.40	TAKE PRIDE IN ONE'S WORK 3.25	ACCEPT RESPONSIBILITIES FOR OWN ACTIONS 3.30	EXERCISE SELF-CONTROL 3.45			

each category are listed in the horizontal rows extending from the right of the category title (labeled "tasks").

Some programs, in the name of saving time and money, have used individual instructors (or a small group of instructors) to identify the tasks to be taught in the program. Typically, this involves simply going through a collection of texts and course outlines and selecting competencies on the basis of personal experience and preference. This approach, though widely practiced, has serious deficiencies that may significantly weaken the curriculum. The task list so identified may be incomplete, out of date, and reflect only the current interests and abilities of the instructor rather than the requirements of the occupation. This approach is hard to justify to either students, the profession, or prospective employers.

It is of critical importance in competency-based vocational training programs that you start with an accurate, complete, and verified competency listing or chart. Without this, no matter how well the rest of the curriculum is developed, or no matter how well the delivery of instruction is organized, the competency-based education (CBE) program is an exercise in futility. Students may be industriously achieving each specified competency in the program but, if they are the wrong competencies, students will not be properly prepared to enter the occupation.

Again, bear in mind that your level of direct responsibility in this process may vary depending on your specific position. Nonetheless, even if you do not have direct responsibility, you need to be aware of the total process so that you can provide assistance to those whose direct responsibility it is.

Assume now that you have either secured the appropriate occupational analyses or have assisted in producing these analyses. This list is, at this point, tentative: (1) it may not represent the total set of skills considered to be essential by local employers, and (2) it certainly does not indicate which of those skills will be covered in your institution's curriculum. It needs to be pointed out that some institutions that produce their own DACUM analyses consider the charts to be final, not tentative. The charts are used exactly as produced by the DACUM Committee and are not revised in any way, nor are the identified competencies subject to further verification. There are obvious risks inherent in using the DACUM results without any further review or input: the number of DACUM Committee experts is usually limited to not more than 12 persons and the public relations value of having other qualified workers and supervisors review the analyses is lost. Thus, some additional steps are recommended.

Verifying Occupational Analyses

Verifying the occupational analysis confirms that the items listed in fact describe the occupation and, specifically, the occupational situation locally into which students will be placed. To structure the verification process, certain decisions must be made: (1) who will conduct the verification, (2) who will participate in the actual verification, and (3) what questions will be asked. In all likelihood, during the decision-making stages, there should be major involvement of three parties: (1) an appropriate administrator, (2) staff responsible for conducting the verification (e.g., those designated as curriculum developers), and (3) advisory committee members.

A member of the administrative staff must be involved. That administrator is responsible for setting up initial meetings with verification staff and advisory committee members. The administrator should also explain to the group what decisions must be made and what and how they can contribute. If the administrator is not to be involved throughout, it is his/her responsibility to delegate authority to someone else--and then to monitor progress to ensure that that responsibility is being carried out. This last item is crucial.

Consider the administrator who decides that curriculum development is important; turns it over lock, stock, and barrel to staff with few directions and little initial guidance; and then forgets about it until the due date. Such an administrator will probably be disappointed with the results.

More often than not, the staff involved do not have the authority to make the necessary decisions, open the right doors, or secure the needed involvement and cooperation. Some administrative presence, even at a distance, is required throughout the development process. During the initial meetings, the administrator should help those involved to plan the verification within the constraints of budget and staff at your school. A "good" idea for which there are not adequate funds needs to be rethought, not squelched. The administrator is usually the one who knows the total picture and has the authority to make any necessary adjustments.

Staff who will conduct the verification should be involved. Again, if staff are to believe in and use the results of curriculum development, they must understand its importance. Their being involved throughout the development process will help them to feel a part of this important procedure and greatly enhance articulation between academic and vocational program areas. Since they have been workers in their field, their inputs are critical.

Advisory committees must be involved. Through common sense and, now, legislative requirement, advisory committees have become a part of vocational education at both secondary and postsecondary levels. The advisory committee for a particular service area and the program advisory committee or craft committee are groups of citizens with expertise in the world of work who are appointed in order to provide vocational instructors with advice concerning preparation of students for employment. As such, they have a key contribution to make to curriculum development, especially to its articulation with other programs and activities. They can provide suggestions concerning what verification questions should be asked, what techniques would secure the most cooperation from employers asked to participate in verifying the analysis, and what employers should be involved. They can also participate themselves in the verification of the list. Clearly, if the occupational program has no advisory group, one of your institution's first steps is to appoint such a body.

At the planning meetings involving these persons, the following decisions will need to be made, with input from all members of the group:

Who will conduct the verification process?

- A member of the administrative staff, such as an evaluation specialist
- A specially appointed and trained group of faculty
- A previously appointed staff, such as a team of curriculum developers
- Other personnel

What questions will be asked?

- If you want only to verify the skills as real and relevant, you can ask incumbents simply to review each item on the analysis and check it if it is actually performed as part of that job.
- If you wish to gather other information relevant to sequencing and curriculum development, your verification instrument or interview could include other questions such as (1) Is the task performed by beginning workers? (2) How often is the task performed? (3) How important is the task? and (4) How difficult is it to learn to perform the task?

Who will be asked to verify the tasks?

- Employees (incumbent workers in an occupation)
- Employers locally who hire workers in this area

- Employers statewide
- Advisory committee members
- With an emerging occupation, a more diverse respondent group may be required

What key activities need to occur and what will be the schedule for their completion?

- Design of instrument or questionnaire, or of interview questions
- Pilot test of instrument with limited respondent group
- Contacting of respondents
- Deadlines for completion

You must be sure that whatever verification process is selected is feasible--and effective--within your budget. Once the decisions have been made, the administrator's role is that of facilitator--making sure any necessary forms are processed through his/her office quickly, being aware of the progress being made, and furthering that progress where possible. If some verification is to be done through interview/observation techniques, the administrator can facilitate that process through such devices as providing the means for training the interviewers, or writing letters of introduction over his/her signature to help interviewers gain the cooperation of employers. At any rate, the point is that, even though verification may not be your direct responsibility, you will need to understand the process, help with the decisions, and monitor progress if you want a good job to be done.

Activity

Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   b. Competency Identification and/or Verification: Indicate clearly how the identification and/or verification of occupational competencies should be handled in your institution.

      - Will you verify locally competencies developed elsewhere?
      - Will you identify competencies locally?
      - What process will you use?

Feedback

After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Competencies," pp. 49-50, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: COMPETENCIES

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning how you will handle the competency identification process in your institution, you: 1. decided whether to identify competencies locally or to verify locally competencies developed elsewhere...........................				
2. made your decision based on: a. the competency identification system currently in use in your institution......................				
b. competency lists prepared within your state for your use (e.g., by the state department)........				
c. competency lists available for your specific vocational/technical programs....................				
d. budget available................				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
3. decided what process to use in identifying/verifying competencies (e.g., conventional, DACUM)..........				
4. decided who would be involved in the identification/verification process (e.g., staff, advisory committees)...				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience III

OVERVIEW

Enabling Objective

Given information on CBE materials, determine the most satisfactory approach to providing materials for your institution.

Activity

You will be attending a large-group presentation on CBE materials. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Using Learning Packages to Facilitate CBE," pp. 53-80.

Activity

You and the other members of your assigned small group will be reviewing and evaluating sample CBE materials, and determining which of the sample materials seem to best exemplify the characteristics of high-quality CBE materials.

continued

OVERVIEW continued

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3c, p. 81, which relates to how you will provide CBE materials in your institution.

Feedback

You will be evaluating your group's competency in developing section 3c of the plan, using the "CBE Implementation Plan Checklist: Materials," pp. 83-84.

Activity

Attend a large-group presentation concerning CBE materials. This presentation will include the following topics:

- Nature of various types of CBE materials
- Pros and cons of developing your own materials
- Sources of existing materials
- Recommended structure for learning packages
- Methods for evaluating materials (selection criteria)

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a summary of information concerning CBE materials, including sample evaluation checklists, you may wish to read the following information sheet.[5]

USING LEARNING PACKAGES TO FACILITATE CBE

Assessing the Situation

Many vocational educators are recognizing the potential of competency-based programs and materials for the improvement of instruction. Although responsibilities in a competency-based program will be similar to those in a more conventional program, the competency-based approach involves some very different concepts and emphases, which affect the way instruction is planned, organized, and delivered. These differences have direct implications for the type of support and guidance staff need to facilitate their instructional efforts. The following questions focus on these differences and can help you determine what steps need to be taken to install a new competency-based education (CBE) program or improve an existing one. Figure 3 depicts a typical CBE program development model that incorporates the process discussed here.

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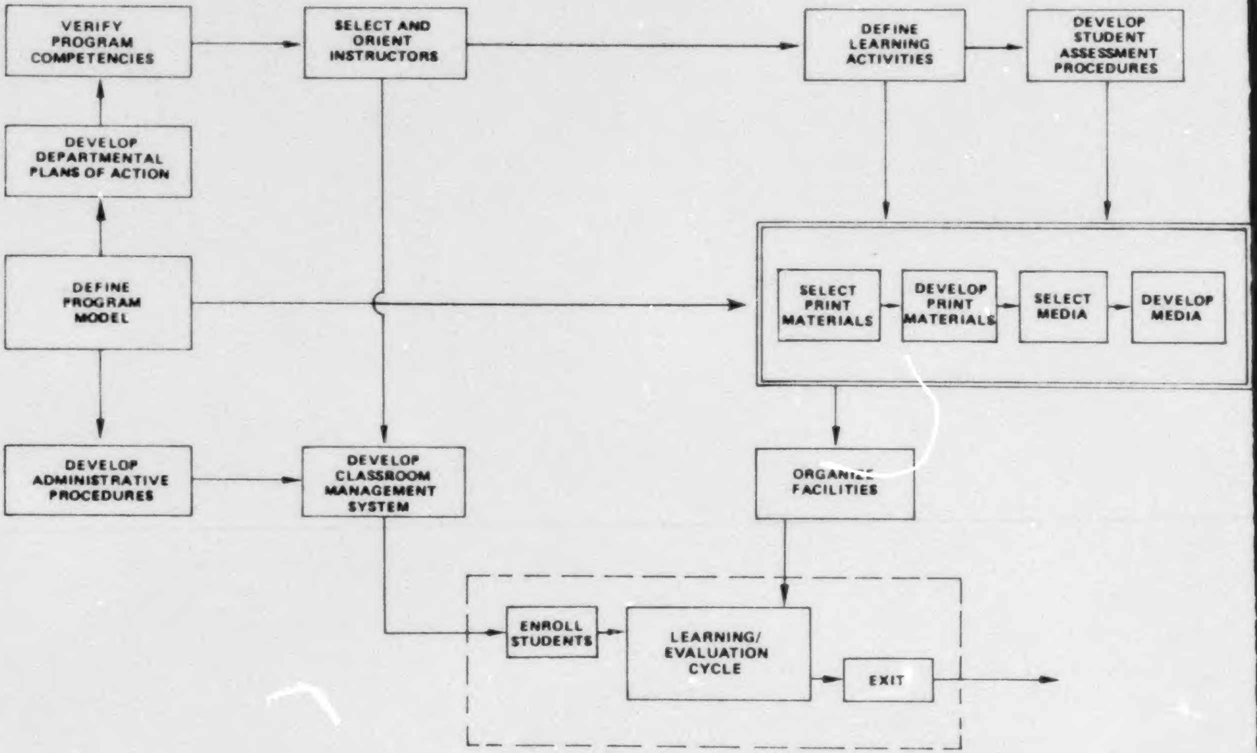
[5] Adapted from Guide the Development and Improvement of Instruction, a Competency-Based Administrator Module (Columbus, OH: The National Center for Research in Vocational Education, 1981).

FIGURE 3

PROGRAM DEVELOPMENT MODEL FOR COMPETENCY-BASED EDUCATION


VERIFY PROGRAM COMPETENCIES
SELECT AND ORIENT INSTRUCTORS
DEFINE LEARNING ACTIVITIES
DEVELOP STUDENT ASSESSMENT PROCEDURES
DEVELOP DEPARTMENTAL PLANS OF ACTION
DEFINE PROGRAM MODEL
SELECT PRINT MATERIALS
DEVELOP PRINT MATERIALS
SELECT MEDIA
DEVELOP MEDIA
DEVELOP ADMINISTRATIVE PROCEDURES
DEVELOP CLASSROOM MANAGEMENT SYSTEM
ORGANIZE FACILITIES
ENROLL STUDENTS
LEARNING/ EVALUATION CYCLE
EXIT

SOURCE: Glen E. Fardig, University of Central Florida, Orlando, Florida, 1979.

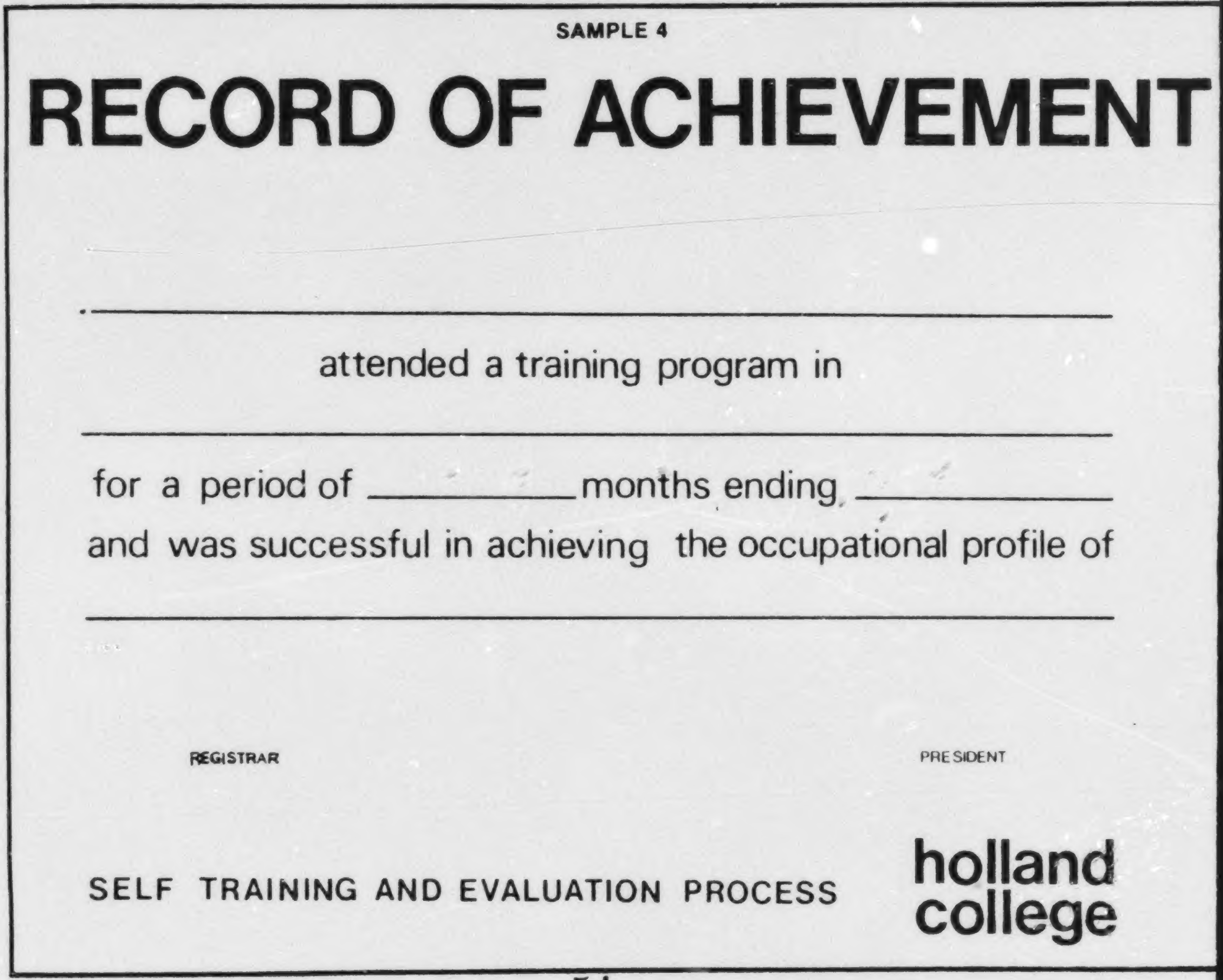
Does a written occupational competency profile (list of verified competencies) exist for each instructional program (or course)? The first essential chracteristic of a CBE program is that the competencies to be achieved by students have been (1) carefully identified, (2) verified by local practitioners, and (3) made public in advance. These competencies should represent those tasks actually performed by workers on the job and essential to the occupation.

Any vocational program--whether conventional, competency-based, or some combination of approaches--should be based on a careful analysis of the occupation to identify the skills, knowledge, and attitudes needed by workers in that occupation. The difference in programs lies in emphasis and in the way the instructional system is designed to help students achieve the specified competencies. Competency-based programs focus directly on the development and assessment of competence, as follows:

1. Competencies to be achieved are carefully identified, verified, and made public in advance.
2. Criteria for assessing each of the verified competencies have been derived from an analysis of the competencies, explicitly stated, and made public.
3. The instructional program provides for the individual development and assessment of each competency.
4. Assessment of the students' competency takes knowledge and attitudes into account, but requires actual performance of the competency as the primary source of evidence.
5. Students progress through the program, ideally at their own rate, by demonstrating their competence.

Thus, the foundation on which any CBE program is built is made up of the explicit, action- and performance-oriented statements of the competencies to be achieved. These should be written down, either in list form or in the form of a profile chart, which the administrator can review and approve. A sample profile chart (this one from the field of resources planning) is shown in sample 4. The graphic form makes it easy to comprehend the nature of the program as a whole and to examine specific areas within it.

A competency profile is, in a sense, the "official document" describing the nature and scope of the program. In addition, it is used to help the students plan their programs. Working with an instructor, each student may review the list and determine that he/she is already proficient in one or more of the required competencies listed. Some competencies may be designated as



SAMPLE 4

RECORD OF ACHIEVEMENT

____

attended a training program in

____

for a period of __________ months ending __________

and was successful in achieving the occupational profile of

____

REGISTRAR

PRESIDENT

SELF TRAINING AND EVALUATION PROCESS

holland
college

SOURCE: Form used by Holland College, Charlottetown, Prince Edward Island, Canada.

RESOURCES PLANNING

Name ____________________

4	C	CAN PERFORM THIS SKILL WITHOUT SUPERVISION OR ASSISTANCE AND CAN LEAD OTHERS IN PERFORMING IT
	B	CAN PERFORM THIS SKILL WITHOUT SUPERVISION OR ASSISTANCE WITH INITIATIVE AND ADAPTABILITY TO SPECIAL PROBLEM SITUATIONS
	A	CAN PERFORM THIS SKILL WITHOUT SUPERVISION OR ASSISTANCE WITH PROFICIENCY IN SPEED AND QUALITY
3		CAN PERFORM THIS SKILL SATISFACTORILY WITHOUT ASSISTANCE AND OR SUPERVISION
2		CAN PERFORM THIS SKILL SATISFACTORILY BUT REQUIRES PERIODIC SUPERVISION AND/OR ASSISTANCE
1		CAN PERFORM SOME PARTS OF THE SKILL SATISFACTORILY BUT REQUIRES INSTRUCTION AND SUPERVISION TO PERFORM THE ENTIRE SKILL
0		HAS SOME KNOWLEDGE AND LIMITED EXPERIENCE BUT NOT SUFFICIENT FOR PARTICIPATION IN A WORK ENVIRONMENT

Ratings on the chart are based on industrial performance standards. They are confirmed by an instructor (a skilled and experienced person from this occupation) who views and evaluates performance as he would in the role of an employer or supervisor.

Instructor ____________________

Date

A letter of reference attesting to the individual's attendance, punctuality, and work habits is available from the Registrar's office.

APPLY EXISTING LEGISLATION RELATED TO PLANNING	INTERPRET AND APPLY ENVIRONMENTAL LEGISLATION	INTERPRET AND APPLY NATURAL RESOURCE LEGISLATION	PROCESS SUBDIVISION APPLICATIONS FOR APPROVAL	PROCESS APPLICATIONS FOR AMMENDMENTS TO ZONING BY LAWS	APPLY REQUIREMENTS OF SUBDIVISION REGULATIONS TO SITE DESIGN	ESTABLISH OWNERSHIP OF PROPERTIES	EXPLAIN AND ASSIST IN BY LAW ADVERTISING PROCEDURES
GATHER AND COMPILE INFORMATION	IDENTIFY SPACIAL DIMENSIONS AND RELATIONSHIPS OF COMMUNITIES	DELINEATE WATER SHED USING MAPS AND AIR PHOTOGRAPHY	EVALUATE MAP CONSTRUCTION TECHNIQUES	READ AND INTERPRET TOPOGRAPHIC MAPS	READ AND EXTRACT INFORMATION FROM CIVIL ENGINEERING DRAWINGS	COMPILE ENVIRONMENTAL INVENTORY	CONDUCT LAND USE SURVEYS
ANALYZE AND REPORT DATA	OPERATE DESK CALCULATORS	PREPARE FACTOR MAPS	DEVELOP DATA TABLES	GROUP DATA INTO FREQUENCY DISTRIBUTIONS	VERIFY ORIGIN AND ACCURACY OF AVAILABLE DATA AND REPORTS	PREPARE SIMPLE ANALYTICAL REPORTS	CONDUCT "SIEVE" ANALYSIS
PREPARE GRAPHIC PRESENTATIONS	OPERATE PROJECTORS AND OTHER EQUIPMENT FOR PRESENTATIONS	SELECT METHODS AND MEDIA FOR PRESENTATIONS	APPLY LETTERING AND DRAFTING AIDS	USE AND MAINTAIN BASIC DRAFTING EQUIPMENT	HAND LETTER LEGIBLY	APPLY CARTOGRAPHIC DRAFTING TECHNIQUES	LAYOUT PROPORTIONS OF MAPS AND PRESENTATIONS
PREPARE MAPS	MAKE LINEAR MEASUREMENTS ON MAPS USING SCALES	CONSTRUCT LINEAR SCALES AND CONVERT TO RATIO SCALES	PREPARE COVER MAPS	ENLARGE AND REDUCE MAPS PHOTOGRAPHICALLY	MEASURE AREAS ON MAPS USING PLANIMETERS	PREPARE BASE MAPS	PREPARE LAND - USE MAPS
CONDUCT ON SITE INSPECTION AND SUPERVISION	INTERPRET LOCATION MAPS AND IDENTIFY PHYSICAL SITE	ESTABLISH LEVEL LINE	CALCULATE SLOPE AND GRADIENT ON GROUND	ESTABLISH AND CHECK GRADES	CONDUCT TRANSIT TAPE SURVEYS	PREPARE SITE INSPECTION REPORTS	IDENTIFY AND RECOMMEND RETENTION OF BIOLOGICAL AND PHYSICAL FEATURES
CARRY OUT PHYSICAL SITE DESIGN	IDENTIFY PHYSICAL SITE FEATURES TO BE INCLUDED IN DESIGN	PLAN ACCESS TO RECREATION AREAS AND OTHER RESOURCES	ANALYZE AND ESTABLISH EFFECTIVENESS OF EXISTING UTILITIES	ANALYZE AND ESTABLISH EFFECTIVENESS OF EXISTING PUBLIC SERVICES	ANALYZE AND ESTABLISH EFFECTIVENESS OF EXISTING STREET PATTERNS	DEVELOP PRELIMINARY DRAINAGE PLAN	DETERMINE FEASIBILITY OF PROVIDING SERVICES AND UTILITIES
IDENTIFY RESOURCE USE CONFLICTS AND PROBLEMS	DETERMINE POTENTIAL EFFECTS OF URBAN GROWTH	DETERMINE DESIRABILITY OF RESOURCE DEVELOPMENT	PRESENT ALTERNATE COURSES OF ACTION AND RECOGNIZE TRADE OFFS	RELATE SOCIO ECONOMIC CHARACTERISTICS TO LAND USE CHANGE	CONDUCT INVENTORY TO DETERMINE EXTENT OF RESOURCE USE CONFLICT	MONITOR AND RECORD EFFECTS OF LAND USE LEGISLATION	IDENTIFY AREAS FOR DEVELOPMENT
ORGANIZE AND COORDINATE PARTICIPATION IN PLANNING	ARRANGE AND SET UP MEETINGS AND DISCUSSION FACILITIES	ESTABLISH AND MAINTAIN LIAISON WITH OTHER AGENCIES	ESTABLISH AND MAINTAIN CONTACT AND FOLLOW UP PROCEDURES WITH GROUPS	FACILITATE GROUP DISCUSSIONS	APPLY PARLIAMENTARY PROCEDURE IN MEETINGS	CONDUCT PLANNING MEETINGS	CONDUCT PUBLIC MEETINGS
MANAGE PLANNING OFFICE	ESTABLISH AND MAINTAIN AIR PHOTO LIBRARY	ESTABLISH AND MAINTAIN GENERAL OFFICE FILING SYSTEM	SET UP AND MAINTAIN TECHNICAL LIBRARY	ESTABLISH AND MAINTAIN MAP FILING SYSTEMS	SELECT AND ORDER MAPS, AIR PHOTOS, AND OTHER INFORMATION SOURCES	ORDER AND MAINTAIN DRAFTING ROOM EQUIPMENT AND INVENTORY	MAINTAIN AND SET UP DATE ACTIVITY CHARTS AND PREPARE PROGRESS REPORTS
COMMUNICATE EFFECTIVELY	USE TELEPHONE EFFECTIVELY	PREPARE APPLICATION LETTERS AND RESUME	LISTEN EFFECTIVELY	COMMUNICATE VERBALLY	TAKE MINUTES OF MEETINGS	COMMUNICATE IN APPROPRIATE TERMS AND LEVELS TO AVOID MISUNDERSTANDING	PARTICIPATE IN TECHNICAL DISCUSSIONS

DOCUMENT CASE FOR ENFORCEMENT OF REGULATION AND BY LAW	EXPLAIN APPEAL PROCEDURES	EXPLAIN AND PROCESS VARIANCE APPLICATIONS	EXPLAIN PLANNING LIMITS OF SPECIFIC LEGISLATION								
CONDUCT BUILDING CONDITION SURVEYS	INTERPRET AIR PHOTOS	IDENTIFY PLANNING PROBLEM AND DEFINE INFORMATION REQUIREMENTS	LOCATE AND RETRIEVE INFORMATION FROM STANDARD DATA SOURCES	EXTRACT RELEVANT INFORMATION FROM EXISTING REPORTS	LOCATE AND INTERPRET ASSESSMENT AND OTHER PROPERTY INFORMATION	READ AND EXTRACT INFORMATION FROM COMPUTER PRINTOUTS	INTERPRET SPECIALIZED RESOURCE MAPS	INTERPRET LAND CAPABILITY MAPS	INTERPRET SOIL MAPS	CONSTRUCT QUESTIONNAIRE SURVEYS	
PARTICIPATE IN ANALYSIS OF POPULATION TRENDS	CROSS COMPARE INFORMATION FROM VARIOUS SOURCES AND TYPES	ANALYZE CENTRAL TENDENCY AND DISPERSION OF STATISTICAL DATA	CONVERT DISTRIBUTION DATA TO VOLUMES DENSITIES RATE AND PERCENTAGES	DETERMINE STATISTICAL CORRELATIONS	EVALUATE DATA AND OBSERVATIONS TO ASSESS PROJECT RESULTS	EVALUATE DATA AND OBSERVATIONS TO ASSESS NEEDS	IDENTIFY FUNCTIONAL LINKAGES BETWEEN COMMUNITIES	CONDUCT RESIDENTIAL NEED STUDIES	SOLICIT EXPERT OPINION DURING ANALYSIS		
PREPARE FINISHED DRAWINGS FROM SKETCHES	CONVERT DATA TO GRAPHS CHARTS AND SYMBOLS	SELECT AND APPLY SEPIA FILM AND BLUEPRINT PROCESSES	TRANSFER INFORMATION FROM AIR PHOTOS TO LINE MAPS	PREPARE LINE DRAWINGS FROM PHOTOGRAPHS OF BUILDINGS	PHOTOGRAPH LANDSCAPES AND MODELS	SKETCH IDEAS FOR COMMUNICATION	PREPARE VISUALS FOR PRESENTATIONS	PREPARE ARTWORK FOR MAP COLOUR SEPARATION	PREPARE LAYOUT OF REPORTS FOR PRINTING	NEGOTIATE PRINTING OR REPRODUCTION OF REPORTS AND PRESENTATIONS	
PREPARE DISTRIBUTION MAPS	ENLARGE AND REDUCE MAPS USING PANTOGRAPHS	PREPARE PROPERTY OWNERSHIP MAPS	PREPARE SITE PLANS	PREPARE AND AMEND ZONING MAPS	ENLARGE AND REDUCE MAPS USING GRID SYSTEM	READ AND INTERPOLATE CONTOURS	PREPARE TOPOGRAPHIC MAPS	PREPARE BUILDING CONDITION MAPS	CALCULATE SLOPE AND GRADIENT ON MAPS	CONSTRUCT PROFILES FROM CONTOUR MAPS	
ASSESS NEED FOR IMPROVEMENT OF STREETS AND SERVICES	TAKE AND ANALYZE SOIL SAMPLES	TAKE AND ANALYZE AIR SAMPLES	TAKE AND ANALYZE WATER SAMPLES	RELATE SITE TO SURROUNDING AREAS	ANALYZE PHYSICAL SUITABILITY OF SITE FOR DEVELOPMENT	MONITOR CONSTRUCTION TO PROTECT NATURAL AND PHYSICAL RESOURCES	QUANTIFY AND COMPARE RESULTS OF ALTERNATE DESIGN SKETCHES				
DETERMINE STREET WIDTHS AND PATTERNS	DETERMINE OPEN SPACE AND PLAYGROUND REQUIREMENTS AND LOCATIONS	DETERMINE LOT SIZES	ESTABLISH ORIENTATION AND LAYOUT OF LOTS	SELECT AND ESTABLISH ORIENTATION OF BUILDINGS ON LOTS	IDENTIFY NEED FOR AND PLAN PEDESTRIAN CIRCULATION PATTERNS	PREPARE ALTERNATE DESIGN SKETCHES	EVALUATE AESTHETIC QUALITIES OF ALTERNATE OF DESIGN SKETCHES	EVALUATE FUNCTIONAL QUALITIES OF ALTERNATE DESIGN SKETCHES			
DETERMINE POTENTIAL EFFECTS OF INDUSTRIAL GROWTH	DETERMINE POTENTIAL EFFECTS OF CONSTRUCTION AND RESOURCE EXPLOITATION	MONITOR AND DESCRIBE EFFECTS OF LAND USE CHANGES	DETERMINE POTENTIAL EFFECTS OF CHANGING WATERSHEDS AND WATERWAYS	DETERMINE POTENTIAL EFFORTS OF COVER REMOVAL AND SUBSEQUENT CHANGE	COORDINATE PLANNING EFFORTS OF LOCAL RESOURCE EXPERTS	PREPARE BENEFIT COST RATIO ANALYSIS	CORRELATE RESOURCE INFORMATION	SELECT AND NEGOTIATE APPROVAL IN PRINCIPLE OF BEST DESIGN			
PLAN AGENDA AND ORGANIZE MEETINGS	ADVISE LOCAL DEVELOPERS AND PLANNING GROUPS ON REGULATION	ASSIST LOCAL DEVELOPERS AND PLANNING GROUPS WITH DESIGNS	IDENTIFY COMMUNITY LEADERS	EXPLAIN IMPORTANCE OF PUBLIC PARTICIPATION IN PLANNING	ORGANIZE INVOLVEMENT AND COORDINATION OF OTHER AGENCIES	PRESENT PLANS TO CONCERNED GROUPS	PRESENT AND DEFEND PLANS BEFORE APPROVAL GROUPS	ADVISE LOCAL DEVELOPERS AND GROUPS ON PLANNING PRINCIPLES	ASSIST COMMUNITIES IN IDENTIFYING GOALS AND OBJECTIVES FOR PLANNING STUDIES	ALERT COMMUNITIES TO EXISTING AND POTENTIAL PROBLEMS NOT GENERALLY RECOGNIZED	
ORGANIZE AND MAINTAIN MATERIAL DISTRIBUTION	DEVELOP SPECIFIC SUBJECT INFORMATION BIBLIOGRAPHIES	ESTABLISH AND MAINTAIN CONTINUING LIAISON WITH OTHER PLANNING OFFICES	PLAN AND DEVELOP VISUAL DISPLAYS OF FUNCTIONS AND PROJECTS OF PLANNING OFFICE	PREPARE BUDGETS FOR TECHNICAL PLANNING OPERATIONS	ASSIST IN PREPARATION OF ANNUAL BUDGETS	ASSIST IN PREPARATION OF ANNUAL REPORTS	PREPARE SIMPLE PROJECT AND COST PROPOSALS				
ADDRESS GROUPS	INTERPRET VERBAL AND NON VERBAL COMMUNICATION	PREPARE AND PRESENT CLEAR INSTRUCTIONS	KEEP ABREAST OF NEW DEVELOPMENTS IN FIELD	WRITE TECHNICAL REPORTS	WRITE TECHNICAL INFORMATION BUSINESS LETTERS	WRITE PROJECT BUSINESS LETTERS					

elective or optional, to be selected according to the student's individual needs and occupational plans.

A profile chart can also be designed to serve as a record-keeping device to monitor and record student progress and completion of competencies (see sample 5). Some institutions issue an official copy of the profile chart as a "Record of Achievement" to students completing the requirements (see sample 4). This takes the place of or supplements the traditional diploma, which signifies completion of course work (or attendance) without indicating exactly what the student can and cannot do.

Have the competencies (task statements) been clustered into appropriate related and logical groupings that can serve as a basis for developing materials and selecting instructional methods? There is considerable disagreement among educators over whether this step is necessary or even desirable. Many contend that each competency, if important enough to be listed separately, should stand alone and be given separate treatment in developing materials and selecting instructional methods. Many others cluster related competencies in order to (1) reduce the total number of instructional packages (modules) necessary, (2) reduce the total number of competencies to a more manageable number, (3) reduce the overlap of content coverage that is sometimes necessary when many task statements are dealt with individually, and (4) help show the logical relationships that various tasks have with each other. A third option, favored by some CBE program developers, is to group those competencies that are of lesser scope or importance and to give individual attention only to those meriting it because of their frequency of occurrence or criticality to job success.

Has an appropriate instructional system been designed and implemented? In CBE, the instructional program must provide for the individual development and evaluation of the specific competencies. That is, each student must be given the opportunity to develop each of the competencies important to his/her training program, and to demonstrate attainment of each competency. This essential element of CBE has strong implications for the type of instructional system needed (including the learning materials to be used), as follows:

- Instruction should be individually paced rather than time-based--Since students progress through the program by demonstrating competency, and since students do not all learn at the same rate, the program should be designed so as to enable students to work and progress at their own rate. This provides each student with the time needed to master one task before proceeding to another and allows everyone the opportunity to succeed in the training program. In contrast, conventional instruction assumes that

SAMPLE 5

Student Competency Profile

ISSOE Form E

Clerk-Typist (clerical)

203.362-010

Name Sherrill Hogueland

Instructor D. Smith

School Occupational Education Center

Program Office Training 140303

Date April 10, 1979

PERFORMANCE \ ISSOE Competencies	020102 Use Telephone Service	020103 Receive/Place Calls	020301 Process Communications	030101 Type Arranged Bus. Letter	030102 Type Unarr. Bus. Letter	030103 Type 2-Pg. Unarr. Bus. Letter	030104 Type Memo–Unarr. Copy	030105 Type Memo–Handw. Copy	030106 Type Table–Arr. Copy	030107 Type Table–Handw.	030108 Type Manuscript	030109 Type Purchase Order	030110 Type Bill of Lading	030111 Type Invoice	050501 Select Duplication Process	060201 Elect. Print. Calculator
Outstanding																
Skilled	Φ	Φ	Φ	Φ					Φ		Φ	Φ	Φ	Φ	Φ	Φ
Satisfactory					Φ	Φ	Φ	Φ		Φ						
Satisfactory with Supervision																

SOURCE: Form used in New York State's Instructional Support System for Occupational Education (ISSOE).

a certain amount of content is to be covered in a specified period of time, thus creating an emphasis on time spent, rather than on competency achievement.

- *Emphasis should be on students' achievement of exit requirements*--Ideally, this means that a student should be able to enter the program at any point and exit whenever he/she has demonstrated ability to perform the competencies required for the occupation or suboccupation. Even if institutional constraints make a totally *open-entry/open-exit* program difficult or impossible to implement--and this is particularly true in secondary schools--the concept can be at least partially incorporated within a more traditional framework. That is, reasonable time limits can be imposed, but, *within* those limits, a good deal of flexibility can be built in.

  Students can be given credit for previously acquired competencies by successfully "testing out on" (performing) those skills. They can be allowed to move on to new skills when they are ready, progressing quickly through some competencies and being given more time on others if they need it. Even if "grading periods" are required, students who need more time can be given a grade of Incomplete for certain competencies--indicating, not that they have "failed," but that they have *not yet* achieved and demonstrated these skills.

- *Learning experiences should be guided by frequent feedback*--The foregoing clearly implies that feedback on student progress should be continuous--built into learning experiences to enable students to identify and work on problem areas and continue their progress without interruption. Individual students should be able to demonstrate and be evaluated on their performance *when they are ready*, not when the group is ready or only at set times (e.g., when grading periods call for it).

- *Instructional materials should be modularized and flexible to allow for different learning styles and rates*--We have said that each student must be given the opportunity to develop and demonstrate each of the specified competencies, and that students do not all learn in the same way or at the same rate. This means that instruction should (1) focus directly on competency development, (2) allow for self-pacing and continuous feedback, and (3) provide a variety of learning activity options.

  An efficient, effective way to deliver this kind of instruction is through the use of individualized learning packages (modules or learning guides). The learning package (1) identifies the objective (competency) to be achieved, (2) guides students through a series of learning experiences and activities designed to help them achieve the competency, and (3) provides feedback devices and specific criteria to be used in assessing students' performance. Students are given explicit directions for what they are to do, what materials and resources they are to use, and how they will know when they have achieved the competency. Optional and alternate activities can be included, and a variety of media and materials can be employed, to give each student an opportunity to master the competency (regardless of learning style and ability).

With students thus taking more responsibility for their own learning and progressing at their own rates, the instructor is free to become more of a resource person, assisting students individually and on a small-group basis as needed, and evaluating performance when each student is ready.

- A variety of supporting instructional materials and media should be provided--CBE programs require a variety of supportive materials and media to assist students in completing learning activities and attaining the specified competencies. If students will be working on and mastering competencies at their own rates, a sufficient variety and quantity of items--such as reference books, programmed materials, films, film loops, slide/tapes, and audio and video recordings--should be provided. This serves to enrich the learning activities; accommodate different learning styles; provide alternate paths to competency attainment; and allow students to study, review, and practice when and as often as they need to.

- Supporting instructional facilities and equipment should be provided--In addition to the regular classroom/laboratory facilities, some type of learning resources center (either within the classroom or shop, or separate and centrally located) should be provided to house the instructional materials, media, and audiovisual equipment students will be using as they complete various learning activities. Study carrels or reading tables, slide projectors, videotape equipment, cassette tape players, conference areas, and files or storage areas for learning packages are some of the items that may be needed to support students' work.

- Teacher orientation and training should be provided--CBE involves some very different instructional concepts, approaches, and skills. Many teachers will need to be oriented to the CBE approach, to their new instructional role (that of resource person), and to the various management and record-keeping procedures involved. If learning packages are to be used, and if these are to be developed in-house, staff will require training and assistance in their development.

Have appropriate individualized learning packages been developed for each competency? Although the use of individualized learning packages is not an essential characteristic of CBE, most fully functioning CBE programs have recognized the potential of this approach for focusing on the individual development and evaluation of the specified competencies for each student.

This means that, in a CBE system, the instructional development process generally moves directly from the identification, analysis, and clustering of competencies to the development (or selection) of learning packages and strategies to deliver on those competencies. The conventional approach--involving as it does more emphasis on content areas and group instruction within specified blocks of time--moves instead to the development of overall plans for a course or program (the course of study), and then to unit and lesson plans.

In many institutions, individual instructors are given total responsibility for developing, continuously updating, and revising the learning packages students will use. Given a list of the competencies to be achieved by students, they decide how each competency will be taught--what prerequisities are required, what instructional strategies will be employed, what criteria will be used to evaluate student performance. These decisions are used to organize the content of the learning packages.

In other institutions, particularly when more than one instructor will be using the materials, the development of learning packages is a team effort. An efficient and productive materials-development team consists of an educational technologist, a typist, and one or more instructors. With CBE, a new teacher may "inherit" from another instructor, not a course of study and series of lesson plans, but a list of competencies and a series of learning packages.

Although some states and districts are developing (and making available) CBE materials in some occupational areas (e.g., learning activity packages (LAPs) developed through the IDECC consortium of states), high-quality materials do not presently exist in all occupational areas. Thus, it is more than likely that staff involved in competency-based instruction will need to develop their own learning packages or at least work with others in a team effort. To assure the production of high-quality, usable, effective materials, funds and staff time will need to be provided for the development effort and staff will need to be adequately trained. Some institutions schedule workshops and bring in outside consultants with expertise in CBE and the development of learning packages.

There are at least two types of learning packages, with some definite advantages and disadvantages inherent in each. *Learning guides* are simple materials. They are reusable paks containing directions for learning activities and explaining where to go for needed resources. They may be developed relatively quickly by school personnel, and they are fairly inexpensive to reproduce. Obviously, their effectiveness is dependent upon the quality and availability of the support resources to which they refer. *Modules*, which are basically self-contained, transportable, and consumable in nature (such as the one you are now reading) have the advantage of being completely under the control of the developers. The instructional content and approach can be tailored to meet the particular needs of the program, and few outside resources are needed. Self-contained modules, however, can be very time-consuming and expensive to develop, and they demand greater expertise in their production. Most CBE programs are now using basic learning guides, adding some instructor-produced instructional materials to enhance the learning activities.

Although CBE learning packages come in a variety of shapes, sizes, formats, and levels of detail, there are certain components and characteristics you and your staff should be looking for, whether the materials are developed in-house or produced elsewhere. Following is a suggested format for a CBE learning package, with brief explanations of each component.

- *Title page*--This section should give such identifying information as the program name, learning package title and number, and competency number(s) covered. A learning package may cover *one* of the competencies identified for the program or a *cluster* of *related* competencies. This decision grows out of the competency analysis process. In the process of analyzing each verified competency for its subtasks, knowledge elements, affective elements, and prerequisite skills and knowledge, it may be determined either that (1) the competency is of sufficient scope and importance to warrant a separate learning package, or (2) two or more related competencies should be grouped, or clustered.

- *Introduction*--Sometimes called the Rationale or Purpose, the introduction should briefly explain to students what competency is to be achieved, why it is important, and how it relates to **other** skills they are acquiring.

- *Directions for use*--At some appropriate place within each learning package, students should be given clear directions for how to use the learning package, including (1) any prerequisites to be completed before beginning the learning package, and (2) procedures for "testing out on" the competency (preassessment). These directions for use are often of two types: those general to a given set or series of learning packages and those unique to the specific learning package in question. In the module you are reading, both types of directions are provided in the Module Structure and Use section, which follows the Introduction. In addition, specific directions for completing each activity are provided throughout the module as each activity is introduced.

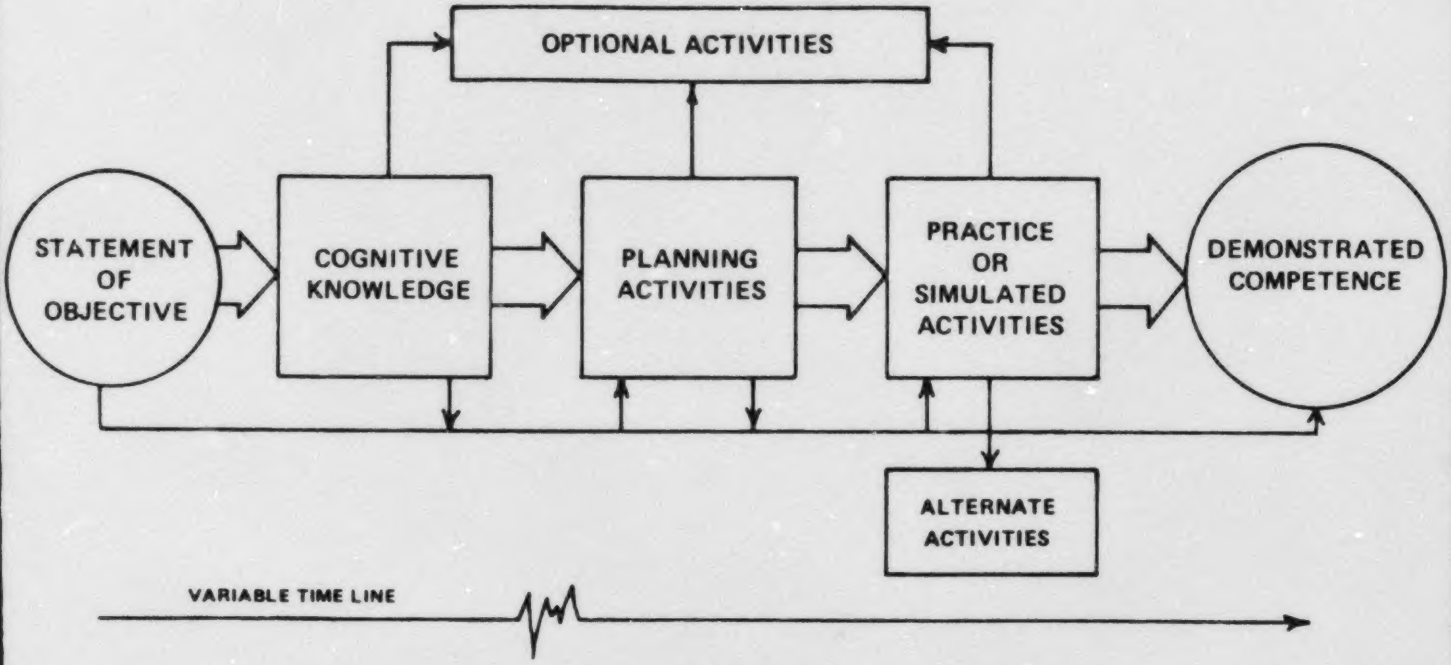
- Objectives--Each learning package should spell out, in performance terms, the terminal and enabling objectives to be achieved. If the basis of the program is, for example, a V-TECS listing of objectives for the occupation, the performance objective(s) of the learning package are usually taken directly from the V-TECS catalog, without change. If some other competency identification procedure is used (e.g., the DACUM process), the terminal performance objective is derived simply by translating the competency or competencies to be covered into an objective that states (1) the overall performance required (activity to be performed), usually simply a restatement of the competency; (2) the conditions under which it will be performed; and (3) the level of performance expected. For example, if the competency were "measure blood pressure," the terminal objective might read "Given a 'patient' and the necessary equipment, measure the patient's blood pressure using standard medical procedures. Your performance will be assessed by your instructor using the final performance checklist contained in your learning package."

  The enabling objectives grow out of an analysis of each competency into subtasks, cognitive elements, etc. Based on that analysis, the developer decides what steps and procedures are involved in performing the competency, what background knowledge needs to be acquired, and what understanding and attitudes are involved. Enabling objectives are then developed that cover those elements, give students the chance to practice the competency, and lead them in a logical sequence to achievement of the terminal objective (see figure 4).

- Learning experiences/activities--Learning experiences should be keyed directly to the achievement of the enabling objectives and, finally, to the attainment of the terminal objective. A variety of activities should be included to allow each student to master the competency. Activities giving students the opportunity to practice

FIGURE 4

SAMPLE INSTRUCTIONAL SEQUENCE FOR CBE LEARNING PACKAGES


OPTIONAL ACTIVITIES
STATEMENT OF OBJECTIVE
COGNITIVE KNOWLEDGE
PLANNING ACTIVITIES
PRACTICE OR SIMULATED ACTIVITIES
DEMONSTRATED COMPETENCE
ALTERNATE ACTIVITIES
VARIABLE TIME LINE

the skill before the final assessment should always be included. These practice activities should be as realistic (close to actual job conditions and requirements) as possible.

Evaluation devices (e.g., self-checks, checklists) to allow for continuous feedback on student progress should be built into the learning experiences.

- Final assessment--In CBE, assessment of student competence requires actual performance of the competency as the major source of evidence. The final performance is often the same as the practice experience(s), except that the student now feels ready to be assessed by the instructor. Students who feel they already possess a competency covered by a particular learning package should be able to demonstrate competency by going directly to the final assessment, without going through the other learning experiences.

  The criteria the instructor will use in evaluating students' performance should be clearly spelled out in the learning package. These criteria are derived from the competency analysis and should reflect actual job requirements. They should be stated in observable, performance terms to allow for as much objectivity as possible.

Sample 6 shows the title page, learning activities page, and evaluation pages of a typical learning guide (this one from a bank teller training program). The complete guide contains all the components described above. The module you are now reading can serve as a model for self-contained instructional materials.

Administrative support is essential if a competency-based instructional system is to be implemented successfully. First, the administrator or program developer will need to ensure that competencies are identified, verified, made explicit, and kept up to date. This may involve providing assistance in locating or conducting the development of occupational analyses (e.g., facilitating the formation of a DACUM committee) or in encouraging the active use of advisory committees.

Second, general administrative support of the concept of CBE and of any resulting changes in administrative requirements or procedures is essential. For example, if instruction is modularized, administrative acceptance of successful module completion as evidence of progress toward program completion will be important. The grading system may need to be completely changed or at least modified (e.g., pass/fail grading instead of letter grades; granting of Incompletes; translation of module/competency completion into letter grades, if such are required). The

SAMPLE 6

LEARNING GUIDE

BANK TELLER

PLACING HOLDS AND STOP PAYMENTS

Introduction

There is a certain amount of risk involved each time a teller cashes a check. There is a possibility that the check is not valid, that the drawer may not have sufficient funds to cover the check, or that the drawer may have stopped payment on the check. A bank must take steps to protect itself from loss through bad checks, and a teller must follow the procedures established by the bank. In this module you will learn to place "holds" and "stop payments."

Directions

Read the two objectives below. If you feel that you are already able to perform these tasks, read the Check-Out Activities on the back cover. Then either arrange with your instructor about doing the Check-Out Activities,

or

If you need to complete learning activities in order to be able to do the tasks, find the Learning Activities inside this module and go through them in the order in which they are listed.

Objective

(1) Given a blank Hold form and a case description, place a hold on the customer's account. All entries should appear without error in the appropriate spaces on the form.

(2) Given a supply of blank Stop Payment forms and necessary information, place a stop payment on a check. All entries should appear without error in the appropriate spaces on the form.

SOURCE: A cooperative effort between the Bureau of Vocational Education, State Department of Education, and the Department of Vocational Education, College of Education, University of Kentucky, Lexington, n.d.

Learning Activities

1 → READ "Holds," in the Bank Teller's Training Manual, pp. 57-59.

(or) ______________________________

2 → STUDY CAREFULLY in the Bank Teller's Training Manual, pp. 57-58, the five reasons why holds are placed.

(or) ______________________________

3 → COMPLETE the sections of a Hold form on Instruction Sheet I, SECTIONS OF A HOLD FORM.

(or) ______________________________

4 ✓ CHECK YOUR KNOWLEDGE of placing holds by completing Student Self-Check I, PLACING HOLDS.

5 → READ "Stop Payments," Bank Teller's Training Manual, pp. 59-60.

(or) ______________________________

6 → READ "Stop Payments," pp. 44-45 and "Alterations," in Bank Teller's Do's and Don'ts, p. 23.

(or) ______________________________

7 ✓ WORK the crossword puzzle on Student Self-Check II, STOP PAYMENTS CROSSWORD PUZZLE.

8 ✓ CHECK YOUR KNOWLEDGE of stop payment procedures by completing Student Self-Check III, STOP PAYMENT PROCEDURES.

9 ✓ ARRANGE with your instructor to complete this module by going through the CHECK-OUT ACTIVITIES listed on the back cover.

Check-Out Activities

The statements below explain the activities you must be able to complete in order to finish this module. After you complete the activities, your instructor will rate your performance using the Instructor's Final Checklist, PREPARING HOLDS AND STOP PAYMENTS.

✓ Your instructor will provide a hold form and a case description. Use the form to place a hold on the customer's account described in the case.

✓ Your instructor will provide a stop payment form and a case description. Use the form to place a stop payment on the check described in the case.

Student _______________

Instructor's Final Checklist

PREPARING HOLDS AND STOP PAYMENTS

Check the student's performance in the following elements of preparing holds and stop payments.

Place an X in the appropriate box indicating not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, the item was impossible to complete, place an X in the "Not Applicable" box.

Performance Level: All items must receive a rating of FULLY ACCOMPLISHED (or Not Applicable). If any items are rated Not Accomplished, or Partially Accomplished, the student and instructor will discuss this and decide which learning activities must be repeated.

	Student Performance			
	Not Applicable	Not Accomplished	Partially Accomplished	Fully Accomplished
1. In the process of placing a hold on a customer's account and completing the form, the student:				
a. Entered account number.	☐	☐	☐	☐
b. Entered date.	☐	☐	☐	☐
c. Entered "by".	☐	☐	☐	☐
d. Entered amount.	☐	☐	☐	☐
e. Entered released date	☐	☐	☐	☐
f. Entered check number.	☐	☐	☐	☐
g. Wrote description	☐	☐	☐	☐
2. In the process of placing a stop payment on a check and in completing the form, the student:				
a. Filled in correct date.	☐	☐	☐	☐
b. Filled in drawer's name	☐	☐	☐	☐
c. Filled in check number.	☐	☐	☐	☐
d. Filled in correct date of check	☐	☐	☐	☐
e. Filled in payee's name.	☐	☐	☐	☐
f. Filled in correct amount.	☐	☐	☐	☐
g. Wrote reason for stop payment	☐	☐	☐	☐
h. Signed form	☐	☐	☐	☐

administrator or program developer may need to initiate or support a move to an open-entry/open-exit system or find other ways to lessen emphasis on rigid scheduling and time requirements. Administrative flexibility is critical if the full potential of the competency-based approach is to be realized.

Third, funds may be needed for the development/purchase of learning packages, supportive media and materials, and additional facilities and equipment (e.g., learning resources center). Alternatively, your institution might join a consortium of institutions to develop materials, thus reducing the costs involved.

Fourth, if learning packages are to be developed, it is critical that these be high-quality materials that in fact assist students in developing the competencies they need. Samples 7 and 8 show checklists that can be used to evaluate the quality of CBE materials. As indicated earlier, staff will need to be given the time to develop the kind of materials required, and training if, as will generally be the case, they lack experience in writing competency-based learning packages. In addition, procedures, time, and resources for pilot testing and revising the materials (based on student feedback and other criteria for measuring their effectiveness) should be built into the development process.

Finally, provision must be made for needed staff orientation to the competency-based approach and the program management system they will be using (e.g., how student progress records are to be maintained). If CBE is being newly installed at your institution and management procedures have not yet been devised, staff will undoubtedly need help in setting up organized, efficient procedures. Visits to institutions that have successfully implemented CBE may need to be arranged, or outside consultants may need to be brought in to provide staff with ideas they can then adapt to your particular setting.

Activity

Break up into your assigned small groups. Each group will be provided with an array of CBE instructional materials. Working primarily on an individual basis, review each of the different materials and evaluate their quality using one of the checklists provided in the information sheet (samples 7 and 8, pp. 73-80). Feel free to discuss your findings with other members of the group informally. You may also move to another small group to peruse their materials once you have reviewed those with which you have been provided, if time allows.

SAMPLE 7

MATERIALS CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
1. The module contains the following basic components:				
a. clear directions for using the module...........................				
b. a rationale or introduction explaining the importance of the skill being covered.............				
c. a listing of performance objectives............................				
d. clear, complete explanations of the activities to be completed in order to reach each objective.				
e. information sheets or reference to a minimal number of outside references containing the needed information......................				
f. devices for immediate feedback...				
g. a criterion-referenced post-assessment form designed to measure actual performance......				
2. The module also contains the following components (optional):				
a. a listing of prerequisites.......				
b. a listing of terminology, and any resources and materials required.........................				
c. a pre-assessment device.........				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
3. The module either includes all necessary materials or clearly specifies what is needed				
4. The module contains a variety of activities				
5. Opportunities for recycling activities are included				
6. The module provides opportunities for students to interact with peers, teacher, and others				
7. Supplementary enrichment activities are provided to meet the needs of interested students				
8. Although the module could be enhanced by group activities, a student could handle it on an independent basis				
9. The module format and activities allow for flexibility and thus can meet the needs of students with different learning styles				
10. The module activities are sequenced in a logical order				
11. The module is well-produced (e.g., good grammar, correct spelling, clear layout, clean copy, neat corrections, etc.)				
12. The module is attractive				

Level of Performance: All items should receive FULL, or N/A responses for the module to be considered exemplary. The "best" module of the group you examined should receive FULL, or N/A on a majority of the items. If many items received NO, or PARTIAL responses, review the other modules to see if the one you selected in fact meets the most criteria.

SAMPLE 8

"PRELIMINARY VERSION"
10-25-79

INSTRUCTIONAL MATERIALS ASSESSMENT CHECKLIST

DIRECTIONS

This Checklist is intended to help assess instructional materials. The Checklist is based upon "Standards for Curriculum/Instructional Materials Developed for Students," approved by the V-TECS Board of Directors. Each question is to be answered YES or NO unless otherwise indicated.

INSTRUCTIONAL MATERIALS ASSESSMENT CHECKLIST

10-25-79

Standard I: Instructional Materials Relevance

*1. Are all the performance objectives in the appropriate V-TECS Catalog or combination of V-TECS Catalogs included in the curriculum package?

( ) Yes ( ) No

NOTE: If the answer to question 1 is "Yes" proceed to question 3. If the answer to question 1 is "No" answer question 2, then proceed to question 3.

*2. If you have deleted from or added to performance objectives in the V-TECS Catalog or combination of V-TECS Catalogs, provide as an attachment the rationale for the specific changes.

*3. If performance objectives are included in addition to those in the V-TECS Catalogs, are they written in accordance with review criteria for V-TECS Catalog performance objectives?

( ) Yes ( ) No

Standard II: Appropriateness of Instructional Materials for Student Target Population

*4. Are the instructional materials appropriate for the student population in terms of:

a. skill level?

( ) Yes ( ) No

b. reading level?

( ) Yes ( ) No

c. concept level?

( ) Yes ( ) No

d. student physical characteristics?

( ) Yes ( ) No

e. educational characteristics?

( ) Yes ( ) No

5. Are the instructional materials adaptable for special student's needs, such as:

   a. physical characteristics (handicaps, disabilities, assets)?

      ( ) Yes   ( ) No

   b. educational characteristics (written, vocabulary, level of abstraction)?

      ( ) Yes   ( ) No

   c. the gifted student?

      ( ) Yes   ( ) No

Standard III: Content Sequencing of Instructional Materials

*6. Are instructional exercises, instructional activities, and enabling competencies (all in support of a performance objective) within the instructional materials sequenced to maximize transfer of skills and knowledge?

      ( ) Yes   ( ) No

7. Are the performance objectives sequenced to move from simple to complex, easy to difficult?

      ( ) Yes   ( ) No

Standards IV and V: Appropriate Instructional Methods and Emphasis on Mastery Learning

*9. Do the instructional methods in the instructional materials allow:

   a. the student to practice required performance?

      ( ) Yes   ( ) No

   b. student's demonstration of achievement of performance objective?

      ( ) Yes   ( ) No

10. When the individualized mode is selected as the method of instruction, was consideration given to:

a. student training objectives?

( ) Yes ( ) No

b. capability for open entry-exit?

( ) Yes ( ) No

c. self-pacing of learning?

( ) Yes ( ) No

d. options in instructional media?

( ) Yes ( ) No

e. mastery as the standard?

( ) Yes ( ) No

f. exemption for those who demonstrate mastery on pre-testing?

( ) Yes ( ) No

* 11. Does the instructional process:

a. closely approximate performance conditions called for by the performance objectives?

( ) Yes ( ) No

b. maximize student participation?

( ) Yes ( ) No

Standard VI: Management of Instructional Materials

*12. Is there an instructor's management plan including:

a. overall instructional content management?

( ) Yes ( ) No

b. a description of how to use the materials?

( ) Yes ( ) No

c. a method of record keeping for instructional materials, tools, equipment, references, and expendables?

( ) Yes ( ) No

d. a recommendation as to the mode of instruction?

( ) Yes ( ) No

e. an identified minimum facility needs?

( ) Yes ( ) No

f. a total listing of required materials, tools, equipment, and supplies?

( ) Yes ( ) No

g. identified required audio-visuals and sensory aids?

( ) Yes ( ) No

h. identified special safety precautions associated with the instructional program?

( ) Yes ( ) No

i. a scoring and reporting system describing individual student performance

( ) Yes ( ) No

j. a method of recording student's progress?

( ) Yes ( ) No

*13. Is there a student's management plan including:

a. overall study management?

( ) Yes ( ) No

b. a description of how to use the materials?

( ) Yes ( ) No

c. a method of obtaining instructional materials, tools, equipment, references, and expendables?

( ) Yes ( ) No

Standard VII (throughout checklist): Indication of Peformance Objectives Achievement

Standard VIII: Instructional Materials Validation

14. Was evidence of an individual (one-to-one) trial of the materials given?

( ) Yes ( ) No

15. Was evidence of a small group trial of the materials given?

( ) Yes ( ) No

*16. Was evidence of a large group (random sample of students) validation (at an acceptable standard) provided?

( ) Yes ( ) No

Production and Reproduction Quality

*17. Did the production and reproduction quality of the instructional materials adquately address:

a. regulations concerning nondiscriminatory presentations?

( ) Yes ( ) No

b. any copyright requirements?

( ) Yes ( ) No

c. that printed materials are camera-ready copies?

( ) Yes ( ) No

d. a standard delivery system for audio-visual components?

( ) Yes ( ) No

* These Items are critical

Activity

Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   c. CBE Instructional Materials/Media: Indicate how CBE materials will be provided in your institution.

   - Will materials be developed or purchased or both?
   - Will a common materials' format be recommended?
   - What major criteria will be used in judging the quality of materials?
   - If materials are to be developed, how will the production of materials be organized? Who will develop the materials? How will their work be supported (training, funds, time)? How will the materials be produced, reproduced, and paid for?
   - If materials are to be purchased, how will outside sources be identified, evaluated, and selected? Will these materials be adapted or used as is? How will the purchase costs be covered?

Feedback

After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Materials," pp. 83-84, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: MATERIALS

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning how you will provide CBE materials in your institution, you:				
1. decided whether to secure materials elsewhere or develop them locally....				
2. made your decision based on:				
a. the instructional materials currently available in your institution..........................				
b. CBE materials prepared within your state for your use.........				
c. CBE materials available for your specific vocational/technical programs.......................				
d. budget available for development.				
e. staff available for development..				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
3. decided on the development process to be used, if materials are to be developed locally, including:				
a. how staff will be trained........				
b. how staff will be **provided** with the development time required....				
c. general format to be used........				
d. media to be included, if **any**.....				
e. criteria **for** evaluating **mate**rials...........................				

Level of Performance: All items must **receive FULL, or N/A** responses. If any item **receives a** NO, **or PARTIAL response,** revise your plan accordingly.

Learning Experience IV

OVERVIEW

Enabling Objective

Given presentations on the roles of the student and the teacher/instructor in a CBE program, determine how students and teachers/instructors in your institution will be oriented to these new roles.

Activity

You will be attending a large-group presentation on the roles of the student and the teacher/instructor in a CBE program. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "The Roles of Student and Teacher/Instructor in a CBE Program," pp. 87-94.

Activity

You will be role-playing a teacher/instructor who is advising a student concerning CBE, or observing such a role-play.

continued

OVERVIEW continued

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3d, p. 97, which relates to how you will orient students and instructional staff at your institution to CBE.

Feedback

You will be evaluating your group's competency in developing section 3d of the plan, using the "CBE Implementation Plan Checklist: Roles," pp. 99-100.

Activity

Attend a large-group presentation concerning the roles of the student and the teacher/instructor in a CBE program. This presentation will include the following topics:

- Changes in the role of the instructor/student in a CBE program
- Changes in the role of the student in a CBE program
- Need to provide orientation activities
- Suggested orientation strategies and activities

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a written review of the material covered in the above presentation, you may wish to read the following information sheet.[6]

THE ROLES OF STUDENT AND TEACHER/INSTRUCTOR IN A CBE PROGRAM

Competency-based education (CBE) will probably be a new concept to many or all of the students and teachers/instructors in your institution. The transition to CBE can be made easier for these persons if they are carefully oriented to CBE and their roles in such a program. This is critical since, in CBE programs, the roles of the student and instructor change from those they are accustomed to.

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[6] Adapted in part from (a) Inservice Education: Managing Competency-Based Instruction, Module IE-8 (Lexington, KY: The University of Kentucky, Curriculum Development Center for Kentucky, n.d.); (b) James B. Hamilton and Karen M. Quinn, Resource Person Guide to Using Performance-Based Teacher Education Materials (Athens, GA: American Association for Vocational Instructional Materials, 1978), pp. 25-33; and (c) The Center for Vocational Education, "Orient the School and Community to Competency-Based Instruction" (Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977), pp. 12-17.

Role of Instructor

The instructor is the single most important factor in conducting an effective CBE program. Instructional materials especially designed for the CBE program are important. A well-planned and structured CBE program is important. Physical resources in terms of facilities and equipment are also important. However, without knowledgeable and competent instructors assisting, guiding, evaluating, interacting, and helping students in the program to develop the desired competencies, continued effective development of those skills will not occur. It is this interpersonal dimension, so important to the individualization and personalization of the program, that the instructor in a CBE program must fulfill.

In carrying out the responsibilities of instructor in a CBE program, it is necessary to function in three general roles: advisor, helper, and evaluator.

Advisor. In the advisory role, the instructor's responsibilities will include orienting the student to the CBE concepts and program. In addition, this role includes helping the student to assess his/her needs and to select a program of competencies to pursue that are relevant to his/her needs and career goals.

Helper. The instructor in a CBE program is more a manager of instruction, or facilitator, rather than a dispenser of information. The instructor no longer simply provides general content information but facilitates, or makes easier, the student's individualized activity and, therefore, interacts more frequently with the student. The instructor is a guide for the student's learning process. He/she helps the student to understand the objectives and to proceed through the learning activities, and remains alert to any problems in procedure.

Instead of spending time conducting large-group lecture/discussion sessions, the CBE instructor will find himself/herself working with individual students when they need specific assistance with the individualized activities. The instructor in cabinetmaking is free to give personal help to a student attempting to master the technique of making a dovetail joint. The electronics instructor and student sit down together to work out a problem in circuit design. The cosmetology instructor watches a student practice hair shaping and offers advice on how to improve the skill. In short, the assistance comes when the student needs it, not when a course of study dictates. There will be few lesson plans, probably no unit plans, but many individual learning plans that guide teacher/student interaction.

Evaluator. Instructors in a CBE program also help each student to keep track of his/her own progress and to decide if and when he/she is ready to demonstrate competency--to perform the required skills and to be evaluated on the basis of that performance. The cabinetmaking student may be ready to demonstrate his/her skill in dovetail joint construction; the electronics student may still be having difficulties with circuitry design; the cosmetology student may be basically competent in shaping hair but needs more practice in order to develop the needed speed and dexterity. CBE instructors need to be continually aware of such individual progress in order to help each student manage his/her learning process well--to help chart progress on specific forms, to help keep a record of competencies attained, and to provide instruction and feedback when, and in what ways, each student requires such assistance. The final evaluation function is, of course, the evaluation of the student's actual performance using a criterion-referenced checklist.

Materials Developer. An additional role required of instructors in some CBE programs is that of materials developer. This is most often true in those programs for which there are no CBE materials already available elsewhere. However, some institutions are supporting the development of materials locally, whether materials already exist or not, in order to ensure that all materials are relevant to the needs of their particular students and their employment community. Materials thus produced can conform to a single format and structure, one used consistently throughout all CBE programs. This simplifies the process of orienting students and instructors to the use of materials and ensures that all materials used meet the criteria established by the institution for its CBE program materials.

Role of the Student

The major change in the role of the student relates to the amount of active involvement required. Many of your students will be accustomed to group-oriented types of instruction in which their role is a relatively passive one. In a CBE program, they will be required to take much more responsibility for their own learning.

Ideally, the student will, from the beginning, be involved in the planning of his/her own program with the instructor. This kind of student participation is critical in CBE even though it may, initially, be quite structured. However, as the student proceeds through the learning activities, he/she may begin to know when to ask for assistance, and when to go alone. For example, the student may request to have performance of a skill assessed when he/she feels ready. When this occurs, the student becomes aware of his/her progress and is more personally engaged in the learning process.

Students know what their own learning objectives are before they begin using their instructional materials. Before a student begins any CBE program and uses any instructional materials, he/she knows the particular learning objectives involved and the conditions and criteria for performance (or demonstration of competency). A student entering a nurse's aide program would not simply practice making a hospital bed or preparing a patient for surgery without first knowing what the objectives for such activities were. The objectives would let the student know (1) what skill he/she will be learning, (2) under what conditions the skill will be learned, and (3) the specific criteria to be used in determining whether competency has been achieved. One of the nurse's aide student's learning objectives might then be as follows:

> The student will make the hospital bed using the procedures outlined on the information sheet provided so that there is only one tight triangular fold on each corner.

Similarly, a horticulture student would be able to know before beginning a study of plant diseases exactly what, for example, the objectives and criteria would be for demonstrating competency in identifying plant diseases. In well-developed CBE programs, student performance assessment is based on specially prepared competency checklists and a rating scale. Students can examine the checklist and determine exactly what the instructor will be looking for; i.e., the techniques to be used, the results to be achieved, the qualities expected. The required level of performance is not some arbitrary standard, but the performance expected of a beginning worker in the occupation. The instructor's long experience and expertise in the field allow him/her to make these judgments accurately.

The student's learning process and instructional materials are individualized and "time free". Although the ideal CBE program includes no formal courses, many CBE programs can reflect varying degrees of integration within traditional programs. Whether CBE is implemented as one part of a formal course, as two or three courses of study within an occupational service area, or in a total vocational program, the student can in all cases use CBE instructional learning packages chosen by the student and instructor to meet the student's particular vocational needs and individual interests. These packages allow the student to proceed at his/her own pace and, when necessary, to "recycle" or return to learning activities already experienced. Some students may have achieved certain occupational competencies through previous experience (e.g., in military service, industrial training, or life experience) so there is no need to go through the learning process again. If this is the case, the student may request to "test out on" a specified competency, consulting with the instructor concerning the time and conditions for demonstrating proficiency. Again, in a competency-based program, it is not important where or how you learn--achievement is what matters.

Because every student's program is self-paced and individualized, students may enter a program whenever they are ready, or when a space in the program becomes available. During the time they are in the program, they work on the sequence of competencies at their own best rate. By "best rate" we mean at the optimal level for their capabilities and personal learning style, not just if and when they choose. Ideally, at no point would a student have to attain a competency by a specified time, but could, in fact, repeat or take an alternate learning experience until he/she is able to demonstrate a competency.

In theory, it is possible to use the competency-based approach in a traditional group-based course, but in practice this works out poorly. At the beginning of such a course, all students in the class would be working on the same competency, but as they proceed, some students will achieve the skill more rapidly than others. Then the teacher is in a difficult position: should the whole class be held up until the slowest student achieves the skill--or shall instruction proceed when the most capable student is ready to tackle the next competency? In the first case, capable learners are idle and bored, and their time is wasted. In the second, slower learners get further and further behind as the course moves without them. Individualized instruction and learning packages seem the only feasible answer.

The student participates in planned, supplementary activities and uses resources designed to add to his/her particular learning experiences. The student does not always work alone. Interaction activities are planned among students who are working on the same competencies. Small-group work is arranged, and discussions are planned, as are the showing of films, the use of slide/tapes, role-playing, and simulation. An experienced worker or expert from the students' occupational service area may also serve as a resource person to help with special problems or concerns at the appropriate time. Field trips, too, can be planned as an excellent on-site resource.

For example, students in child care programs may need to discuss frequently the basic techniques they are all learning. Films may be used to address common concerns of students in a decorating, painting, and drywall program who may all need to see demonstrations of special techniques and problems that cannot be demonstrated in the vocational laboratory. Role-playing and simulation may help a small group of dental assistant students in procedures and techniques for talking with patients and interacting with employers. An expert welder may often be able to offer solutions and "tricks of the trade" to students who are all involved in similar kinds of welding activities. A trip to a food packaging plant may give students in a packaging program a chance to feel what the job environment might be like, what kind of co-workers the student could expect to have, and actual job skills being performed during a real work day or job shift. It is a bit more difficult to schedule such events in an individualized program than in a conventional program, but it can be done.

Orientation Needs

Changing roles can be frightening. We all fear the unknown to some degree. This fear can be greatly reduced or eliminated by making the unknown known, by familiarizing those involved with what they're getting into, by orienting them to CBE. In most cases, program developers or administrators will be responsible for orienting the instructional staff. Instructors, then, would be responsible for orienting their own students. This can serve to keep the size of the groups being oriented small, which is preferable.

Instructors and students will need to be oriented to the following areas:

- CBE concepts in general (What is it? Why use it? What are its essential elements and desirable characteristics?)
- Specific characteristics and management features of your CBE program
- Changing roles of student and instructor
- CBE learning packages to be used
- Facilities (resource center, file system for materials, etc.)
- Evaluation system to be used (devices and procedures)

If instructors are expected to develop their own learning packages, then some orientation and training must be provided to prepare them for this task.

Orientation Techniques

There are a variety of techniques and devices that can be used effectively to orient these persons to CBE, either on an individual, small-group, or (if absolutely necessary) large-group basis.

Handbooks. By preparing written CBE handbooks targeted to specific audiences (students, instructors), you can ensure that all the facts about your program are readily available to the users. The handbook could contain a review of the characteristics of CBE as well as the specific characteristics of your program. Procedures (credits, fees, evaluation) can be outlined and sample forms included. This handbook can serve as a review and guidebook for persons who have participated in group orientations previously. For the instructors or students entering the program after orientations have been conducted, this handbook can introduce them to the program quickly.

Media. Media, such as slide/tapes describing CBE and various aspects of your program (how to use the resource center effectively) are another means of orientation that can be used either to supplement and enhance a group orientation session or to orient people on an individual basis. These, too, should be targeted to specific groups; students and instructors need different information. For example, the instructor needs to know how to organize and manage the resource center; students need to know how to use it effectively.

Mini-experiences. Probably one of the most effective ways of introducing students or instructors to CBE and your CBE program is to arrange for them to participate in hands-on experiences. If learning packages are to be used in the program, then experiences should be provided to familiarize users with their format and procedures for use. Some institutions use a "module walk-through," providing each instructor or student with a sample module and then going through it with them page by page, explaining what is there, why it's there, and what you should do with it.

If there are unique aspects in the facilities to be used, going beyond a simple explanation of these aspects is helpful. Arrange for people to visit these facilities and explore. Design activities that involve them in using the facilities. For example, prepare worksheets that require them to locate materials in the resource center, to work with the filing system, to locate information in the record-keeping system. Whatever the system used at your institution, you can design specific activities to get people using it in a practice situation.

A more substantial form of practice can be provided by having participants actually acquire a small skill using the competency-based approach. For example, participants can learn to gap spark plugs using the CBE learning materials, with help available from an "instructor." They can, thus, experience the whole process, with supervision, and can raise questions if needed.

Visitations. For instructors in an institution that has not previously had any CBE programs in operation, it is often helpful to arrange for them to visit other schools and observe CBE programs in operation. Such visits should be carefully planned so that instructors, in fact, get to see the important features and have an opportunity to ask questions. Wandering around the facility is not sufficient; the visit must be a structured learning experience to be useful.

For instructors and teachers, these experiences can often be part of the regular staff development program, perhaps in a workshop setting (e.g., materials development workshop). For students, orientation can occur during their first few days of the program. With a well-thought-out, carefully planned, and thorough orientation, the chances are good that the program will operate smoothly and successfully and that all involved will be confident about what they are doing, how, and why.

Activity

Your resource person will tell you which of the following two activities you will be participating in.

1. Attend a large-group session in which a resource person will conduct a role-play with one participant, illustrating how to conduct a student entrance interview for a CBE program.

2. Join the other members of your assigned small group. A resource person will assume the role of "student" and select questions from the "Student Questions" below to ask of his/her "resource person/instructor." You and the other members of your group are the resource persons and should respond to the "student's" questions in that role.

   Do not just answer yes or no; this student is apprehensive about CBE. Your answers need to help him/her understand, adjust to, and accept the CBE concepts and program characteristics.

STUDENT QUESTIONS

a. I saw the chart of competencies for this occupation and there are an enormous number of them. Do I have to complete every one of them?

b. I was in the service and I got a lot of training in this occupation. Can I get credit for all that?

c. Why are we going to use those little learning packages instead of a real textbook?

d. I'm not such a good reader. I don't know if I can understand all that stuff in those learning packages. Where does that leave me?

e. I talked to other students about this "individualized instruction" thing. Does that mean I'll have to work all by myself without your help?

f. In the other courses I take, they give tests at the end of each semester to find out if you pass. Here I have to take a performance test on every skill. Why?

g. Suppose I'm not so hot on some skills, but pretty good at others--can I average them out?

h. What if I fail some of these competency tests? Do I have to take the whole course over?

i. I need to finish this program and get out and find a job as soon as I can; I'm just about broke. How long will it take?

j. How do I know I can get a job after I finish this program? Will I really be prepared?

Activity

Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

    d. Instructor/Student Role Orientation: Describe how the instructors/teachers and students in your institution will be oriented to their new roles.

    - How can the cooperation of these persons best be obtained?
    - What orientation activities will be conducted?
    - What orientation materials will be used? How will they be developed/obtained?

Feedback

After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Roles," pp. 99-100, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: ROLES

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning how you will orient students and instructional staff at your institution to CBE, you:				
1. considered their current level of awareness concerning CBE............				
2. tentatively outlined strategies and techniques to be used in the orientation process, including those designed to orient students and instructional staff to:				
a. characteristics of CBE...........				
b. their changing roles in a CBE program.........................				
c. your specific CBE program........				
d. CBE instructional materials......				
e. CBE facilities..................				
f. CBE process.....................				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
3. identified persons who could conduct the orientation process........				
4. identified materials needed for the orientation process and how they would be obtained..................				
5. considered staff and budget limitations in making your plans..........				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience V

OVERVIEW

Enabling Objective

Given information on CBE assessment procedures and devices, plan for the development and use of appropriate evaluation instruments and grading procedures within your institution.

Activity

You will be attending a large-group presentation on CBE assessment procedures and devices. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Assessment Procedures and Alternatives," pp. 103-113.

Activity

You may be participating in a large-group activity in which the group will develop an assessment device under the direction of a resource person.

continued

OVERVIEW continued

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3e, p. 115, which relates to the CBE assessment procedures you will use in your institution.

Feedback

You will be evaluating your group's competency in developing section 3e of the plan, using the "CBE Implementation Plan Checklist: Assessment," pp. 117-118.

Activity

Attend a large-group presentation concerning CBE assessment procedures and devices. This presentation will include the following topics:

- Assessment of product/process/attitudes
- Assessment of the "whole" (i.e., can students "put it all together")
- Rating scales

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a written review of the material covered in the above presentation, you may wish to read the following information sheet.

ASSESSMENT PROCEDURES AND ALTERNATIVES

The power of competency-based vocational education is found in its three undergirding principles: (1) the content of instruction is derived by accurately identifying the tasks needed for entry into the occupation, and these tasks are specified in advance; (2) instruction is focused directly on the tasks the trainee is to acquire; and (3) assessment of trainee competence is based on the occupational tasks, using the criteria of the occupation. If that final principle is haphazardly applied, the entire structure of competency-based education (CBE) begins to lose its strength and tends to collapse in a heap of shattered ideals and broken promises. Only through a carefully conceived and efficiently managed student assessment plan can CBE realize its potential for revitalizing vocational training. No one should assume that assessment in a CBE program is simple and easy; it is not. However, the fact that it can be done well is attested to by the existence of scores of successful programs underway around the country.

Vocational education has a long history of clearly stating the goals of instruction and has obtained reasonably good evidence of student achievement. CBE seeks to carry this one step further, making student assessment more rational, systematic, and rigorous. There is still a need for clear thinking about (1) what constitutes competence, (2) what constitutes acceptable evidence of proficiency, and (3) how you go about collecting the evidence. If you examine a number of CBE programs, you will soon come to the conclusion that there are significant differences of opinion on these questions. There is no disagreement, however, on the point that, in competency-based instruction--as contrasted with conventional group-based instruction--a much greater emphasis on assessment is essential.

Student performance assessment in CBE can be both time-consuming and demanding. However, less time is needed for such things as formal lesson planning and preparing formal presentations than in conventional programs. The time thus saved can be spent (and will need to be spent) on student assessment. There is certainly nothing wrong in this; it simply corrects a long-term imbalance and strengthens the learning that can occur when an instructor thoughtfully and systematically evaluates a learner's attempt at skills performance. The real trick is to devise a working assessment system that includes all the essential features of CBE and is also feasible and practical for a typical vocational instructor to use.

A Question of Knowledge

Anyone implementing CBE must deal with the meaning given to the term competence. This is a more complex question than is immediately apparent. It has implications for the kind of instruction that is provided, and it has a bearing on how student assessment is done. Should competence mean the mastery of knowledge? Should it mean the acquisition of specified skills? Leaders in competency-based instruction are gradually accepting Del Shalock's definition:

> Competence is the demonstrated ability to successfully apply knowledge and skills in the performance of complex tasks; e.g., those required to function effectively on a job.

If one accepts this, then the mastery of knowledge is an enabling objective of competence. Cognitive knowledge should not, then, be assessed as an end in itself. Assessment of knowledge, in this sense, is useful only to the extent that it helps the trainee to learn information that is crucial to the task and to determine personal progress. Thus, the traditional paper-and-pencil test of knowledge has a strictly limited (but nonetheless important) place in a competency-based vocational program. Of course, if you are training tour guides, then knowledge (in the form of local history and geography) might be the most important part of your program, and you would assess students accordingly.

Usually, what the vocational instructor will most want to assess is the student's ability to apply knowledge in a job situation. This can be done by watching a student's performance or checking a final product. In taking an architectural photograph, for example, students will need to draw upon their fund of knowledge as they select the appropriate film and filters for the available light, adjust the aperture, and position the camera. The instructor's final assessment can be based upon the quality of the photographic negative produced, not whether a student can explain the theory of perspective or describe the chemical and physical properties of film.

Because the test of knowledge is so deeply ingrained in our schooling, instructors have a hard time discarding it as the primary evidence of student competence. This is particularly true in fields such as health occupations or the technologies where the knowledge base is extensive and complex. Some programs combine the results of paper-and-pencil tests with those of skills performance tests to arrive at a decision about whether a student is competent or not.

Keep in mind, however, that instructor-made written tests of knowledge have an uncertain reputation for validity and reliability. No one is quite sure what such tests measure, or how consistently they measure it. Usually, some arbitrary score (perhaps 70 or 80 percent) is selected as evidence that the student has "passed," presumably meaning that he/she has mastered the content. Vocational instructors have never claimed to be evaluation experts either, so it is not surprising that the tests they develop sometimes leave something to be desired. Instructor-made tests are, therefore, probably best used as "enablers," leading to mastery of the essential background information, which will later be assessed as it applies to the final performance or product.

Criteria of Performance

After occupational competencies have been identified, the first step in setting up CBE assessment procedures is to decide what criteria will be used to measure student competence. Conventional vocational programs also confront the problem of establishing criteria. However, in a competency-based program, this question must be handled much more systematically. For each specified occupational competency, you must decide what method you will use to validly and fairly assess each student's proficiency: (1) you might evaluate the characteristics or qualities of a product produced by the student, (2) you might observe and rate the process or performance--including attitudes--that the student goes through in the course of completing the task, or (3) you might want to record the amount of time the student requires to complete the task. Often a combination of these three may be necessary in order to make a thorough assessment.

Product. Usually, the product produced by the student is the best measure of his/her ability to accomplish the task. A product is something tangible--such as a machine part, a set of manicured fingernails, or a healthy philodendron plant. In occupational training, the finished product tends to be the most valid evidence; it is readily measured, and the measurement can be done with relative objectivity. Criteria statements can be made to clearly describe an acceptable product with a great deal of accuracy; e.g., "diameter must be plus or minus 1/1000 inch," or "the document must be typed **without** errors, erasures, or strikeovers."

Process. In some competencies, the process followed in producing a product or performing a skill may be of paramount importance. This is particularly true in the service occupations, but process may also be a factor in almost any occupational area. The student's performance will need to be assessed when (1) there is no tangible product (e.g., "greet visitors to the office," or "place long-distance telephone calls"); (2) in cases in which critical inner parts of a final product are hidden from view (as in a surgical dressing, where inner aseptic measures and medications are of even greater importance than the outer visible areas); or (3) in situations in which sanitation or safety procedures are of extreme importance and must be meticulously observed. It may be true that, in the past, schools have tended to place more emphasis than business or industry on the "right" way to go about a task.

Time. The factor of time is seldom assessed as the sole criteria; it is almost always combined with product or process criteria. Speed of production has long been associated with business-and-office skills, but it also must be rated in a number of trade and industrial occupations. Time standards may come from specific industry documents, such as the automotive flat-rate manual with, for example, 90 minutes allowed to remove and replace an engine. Or they may derive from general trade agreements, as in the masonry standard of laying 800 bricks a day. It is important, however, that the time the student takes to complete a task to demonstrate competency is not confused with the time the student needs to learn that task. In CBE programs, the student should be allowed whatever time is needed to learn. Once the task has been mastered, the trainee then **must be able to** perform it within the time specified by the criteria.

Combinations of criteria. Usually, a single type of criterion is not used alone, but in combination with others. It is necessary to assess not only the quality of the final product, but also the correctness of the process by which it was completed, and how long it took the student to complete.

It is worth emphasizing that the measurable criteria of assessment in a CBE program must be those of the occupation, the ones used by people who assess workers on the job (the foreman, supervisor, or professional in charge). They cannot be arbitrarily selected by the instructor on the basis of personal preference. All trainees who are to be credited with having mastered a competency must be subject to the same criteria of acceptability.

Level of Student Performance

Educators have sometimes been uneasy about the standards of performance they expect of their students. It is often difficult to fully justify the traditional system of norm-based assessment. In addition, some teachers set rather personal and arbitrary standards--to students, some are known to be "tough" and others "easy" graders. Furthermore evaluation is many times based on school expectations rather than employer requirements.

The position of competency-based occupational education is quite different. The ultimate standards of acceptable performance are those of the occupations students will be entering. In many ways, this simplifies the task of setting performance standards, but it doesn't make it any easier to judge whether the standards have been attained. Actually, business and industry can accommodate quite a wide range of proficiency, from employees who need strict supervision as they work at a task, to others who are not only competent themselves but capable of supervising others. Employers also accept that an employee may be better at some tasks than at others and arrange assignments accordingly. What is probably most important to the employer is to know more precisely what the prospective employee can and cannot do, and the level at which he/she can do it.

In some CBE programs, the responsibility for determining the level of acceptable performance rests completely with the instructor. The reasoning there is that the standards for each task are set by the occupation (either explicitly or implicitly), and there is no one better qualified to know and apply these standards than the instructor. He or she is a skilled occupational specialist, with either current or recent experience in the field. The instructor, in this case, observes the student performing a task and evaluates the performance or product just as the foreman or supervisor would on the job. The instructor takes a long, penetrating look at the work and simply knows that it is acceptable or not acceptable, right or wrong.

Other CBE programs tend to give the instructor much more guidance in setting the level of performance. Mager-type objectives are written to include not only a description of the conditions under which the task shall be performed, but the criteria of acceptable performance (e.g., "with 80 percent accuracy"). Sometimes behavioral objective writers simply pass on the responsibility by specifying that the task is to be done ". . . to the satisfaction of the instructor." Written criteria can be the work of the instructor, a curriculum developer, or a panel of experts. The catalogs produced by the Vocational-Technical Education Consortium of States (V-TECS) are examples of materials that contain stated criteria of performance for the instructor to use in evaluating students.

In either case, it is of critical importance that the vocational instructor keep up to date on the level of performance expected by employers in his/her occupational (and geographical) area. Occupational requirements change over time; a carpenter applying siding to a house in Homestead, Florida in 1960 could produce work that would not be tolerated in Minneapolis in 1980. An active advisory committee, regular on-the-job experience, and frequent contact with incumbent workers all help the instructor keep informed of the level of performance he/she should expect of students.

Some schools (notably Holland College) differentiate among student levels of performance, others (such as Minnesota's 916 AVTI) do not. In this latter situation, all students must meet mastery level in order to receive credit. If a student attends fewer hours, learns more slowly, or leaves before completion, he/she is credited with fewer masteries, not ones at lower levels. At Holland College, students are expected to achieve at varying levels of skill, so the rating scale and reporting system provide for this. In addition, if a student is not satisfied with his/her rating on a specific competency, he/she may undertake additional learning experiences and attempt to raise the level of performance.

Checklists and Rating Scales

The use of checklists in the assessment of students in a competency-based program is a widespread and successful technique. Checklists are fairly easy to construct since they consist of statements of criteria in short and concise form. Instructors can use the checklists as a guide in observing students' performance and examining final products. Copies of the appropriate checklists for the competencies on which they are working are made available to students well in advance of instruction, so they know exactly what is expected of them if they are to attain mastery. This has proven to be one of the most valuable learning devices to derive from the CBE approach.

Instructors and curriculum specialists can develop checklists by elaborating on the competency itself. These criteria should be well known to the competent occupational practitioner. The following list describes a few of the more important qualities of a checklist:

- One checklist should be constructed for each major competency in the program.
- The checklist should be short enough to make it practical for the instructor to use. Perhaps five to ten items are sufficient for a lower-level skill, ten to twenty items (at the most) for complex competencies.
- The criteria included must be critical to the success of the skills. Minor or trivial criteria just make the instructor's evaluation job more difficult and time-consuming.
- Each criterion should have some qualitative base. It is not enough to record that the student did something; he may have done it very poorly or very well, and this needs to be shown.
- The items must be simple and unambiguous--quickly read and understood by the busy instructor.

CBE programs just being installed can get a great amount of help from outside sources in developing checklists. Most V-TECS catalogs include checklists for the appropriate competencies. Other CBE programs can furnish checklists they have developed for their own use. Textbooks often contain lists of the qualities desired of a specific product or performance, and these can be translated into checklist form.

Every checklist implies some sort of rating scale, even if the rating for each item is nothing more than a Yes or No. Some vocational educators maintain that, in a competency-based program, the student should be rated only on whether or not he/she did indeed achieve the stated criterion. The rating scale for each criterion should, therefore, be a simple "go/no-go" type--yes, no; mastery, no mastery; acceptable, not acceptable. This has simplicity in its favor, but has limits of usefulness. It also forces the instructor to draw a fine line between acceptable and unacceptable performance.

Other rating scales permit a degree of latitude and provide the student with more information about his/her performance. The levels might include the following:

- Not Appropriate, None, Partial, Full
- Poor, Fair, Good, Excellent
- Not Acceptable, Acceptable, Outstanding

Other variations are, of course, easily possible. In each of these, a minimum acceptable level is specified, but the other levels on the scale permit the instructor to recognize unusual achievement, or to counsel with the student regarding certain weak areas that must be brought up to standard before credit for the total competency can be awarded.

As in individual criteria, ratings for the total competency being assessed can be of the mastery/no-mastery type, or can differentiate among levels of overall performance. A multi-level rating scale for each competency in the occupational program has two major advantages: (1) it allows the student to relearn and work toward higher ratings, and (2) it provides more information to the prospective employer about the actual competence of the job applicant. One such rating scale that has proven successful has a five-level system:

0 - Unsatisfactory performance or no performance

1 - Some ability to perform the task; requires supervision

2 - Can perform task satisfactorily with periodic supervision

3 - Can perform task without supervision

4 - Can perform task with more than acceptable speed and quality

Typically, the employer would hire those who were able to perform competencies essential to his/her business at the 2 or 3 level. Level 4 would probably be attained only by more experienced persons in the occupation who have had an opportunity to apply the skill in a number of different situations.

Developing a rating scale for your institution will be one of the more important things you will do as you install CBE. The final outcome will need to be consistent with the instructional model and philosophy of the institution. It will also need to be acceptable to instructors, understood by students, and backed by administrators.

Practical Problems of Assessment

Conducting performance tests may seem like a straightforward matter, but there are a number of practical problems to be solved, both by the curriculum designer and the instructor in the classroom or laboratory. Just as in written tests of knowledge, the old questions of validity and reliability need to be dealt with. The instructor must devise an assessment situation that measures what it is supposed to measure. This is not particularly difficult if the competencies are very carefully stated in terms of performance and if the instructor is going to observe the student on every competency. If, however, there are so many similar competencies that only critical ones can be selected for assessment--with those serving as indicators of total proficiency--then the selection must be made with great care to be sure that the right skills are measured.

Reliability is a critical issue because, in a competency-based vocational program, any performance test can be expected to be given at many times during the school year. The conditions of the test must be such that students of equal ability will receive an equal rating, no matter when they perform. This means that the materials, tools, and conditions of the test should be identical. In setting up a test such as troubleshooting a malfunctioning refrigeration system, for example, the refrigeration unit and the defect to be located should always pose a problem at the same level. However, it can't always be the same problem because word would soon get around among students, making the test useless.

In addition to general concerns about validity and reliability, the instructor must solve the problem of providing real occupational situations in which to assess students. The difficulties here involve the amount of time available for assessment, the resource required, the hazards involved, the unpredictability of human behavior, and occupational situations that cannot easily be duplicated. Some brief examples will help clarify these ideas.

Time required for assessment. Ideally, each student should be observed carrying out the entire process involved in completing a competency. But followed to the letter, this could take an enormous amount of time, both for the student and for the instructor. Consider a chef training program in which there are three competencies (among scores of others) that require the trainee to prepare roast meat, roast fish, and roast fowl. Is it feasible to have the trainee do all of these time-consuming tasks just to be evaluated, or will selected operations in roasting be adequate indicators of proficiency?

One time-conserving technique is to use more advanced students to check out beginning students on lower-level skills. Another is to set aside a certain period of each day for assessment, reserving the rest for individualized instruction and conferences. If students are sent out for field experiences, on-the-job supervisors can be trained to make the appropriate assessments.

Resources required. Traditional tests and quizzes might call for nothing more in the way of supplies than a clean sheet of paper. However, in some competency-based trade and industrial programs, the amount of materials used up in assessment could be very substantial. If you are assessing students' ability to hang a door, for example, you would want to furnish a new door and frame for each student, but this expenditure of resources might just not be possible. Clever reuse of materials is helpful here. For example, in auto body repair, the same fender could be used to perform and assess straightening sheet metal, using body fillers, applying paint, and finishing painted surfaces. Another problem, common to many occupational areas, involves assessing a student on the operation of an elaborate piece of equipment that is not available in the school. Arranging to "borrow" the use of the equipment from a business or agency and doing the assessment on location may be the answer.

Hazards involved. The very act of performing some operations for assessment may create personal hazard for the student and the instructor. This is especially true in assessing the student's ability to control emergency situations. It may not be wise, for example, to have a student braze a leaking gasoline tank in the school shop. If the student makes an error in the procedure, neither student nor instructor may be around to discuss the results of evaluation. Similarly, it may promote realism, but it is unrealistic to pour molten metal on a damp concrete floor just to evaluate whether the student reacts properly to the emergency that will result. The solution could be to devise situations one step short of full reality, or to break the hazardous operation into small actions, with the instructor ready to stop the process instantly if the student is about to make a serious error.

Unpredictability of human behavior. Machines can usually be depended on to respond in known ways to a student's prformance. Including people in the assessment situation introduces (as always) an element of unpredictability; yet many competencies involve dealing with people as co-workers, customers, or clients. If the competency statement requires the student to "assign work to others," it is important to observe and evaluate the response from the other persons, which may be one of resentment, friendly cooperation, or dull apathy. This kind of assessment situation makes it difficult to anticipate the reactions and prepare a fair assessment instrument. Role-play techniques, or use of videotaped situations to which the student responds, could be necessary substitutes.

Occupational situations that cannot easily be duplicated. A competency in a practical nursing program might involve preventing a person from choking using the Heimlich Maneuver, a technique requiring quick and strong pressure to the victim's chest. Obviously, the best assessment situation would be to bring into the laboratory a person who is indeed choking, with a large piece of food lodged in his/her windpipe. At the time of assessment, however, it is unlikely that such a person can be found, so having the student demonstrate the technique on a normal fellow classmate may have to suffice. (Cracking a rib in the process is a real hazard in this simulation.) This kind of assessment problem (i.e., in which the student needs to perform a skill in situations that are difficult or impossible to set up) occurs most frequently in health occupations, but also may be found in agriculture (e.g., "control an infestation of mole crickets in turf grass") and service occupations. There are no easy solutions. Again, role-plays, simulations, or tests of knowledge may have to be resorted to. In some instances, it is only necessary to delay final assessment until the specific situation occurs naturally in due course; at certain times of the year there are more than enough mole crickets to go around.

Solving the practical problems of assessment is the direct concern of the occupational instructor. However, in this, as in all aspects and phases of the assessment program, the curriculum developer needs to be equally involved. The competency-based instructional model adopted by the school or college must provide for student assessment and deal with it in considerable detail. Variations in assessment procedures needed by programs that include clinical experience or on-the-job training must be worked out in advance and agreed to by the faculty and staff who are affected. All of this requires considerable cooperative effort, planning, and foresight.

Activity

You may attend a large-group session in which a resource person will lead the group in develping a CBE assessment device for a given skill (e.g., filling a car's gas tank). You and the other participants will suggest criteria to be included on the assessment device to measure the process, the final product, and related attitudes.

Activity Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   e. Assessment Procedures: Briefly describe the appropriate CBE evaluation instruments and grading procedures for your institution.

      - What types and levels of assessment are needed?
      - What types of instruments will be used? Will they be developed in-house or obtained from outside resources? What sources?
      - What assessment procedures will be used?
      - What performance standards will be set?
      - What are the roles of the instructor, student, and administrator in assessment?
      - How will grades for completed modules and for courses be determined?

Feedback After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Assessment," pp. 117-118, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: ASSESSMENT

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning the CBE assessment procedures you will use in your institution, you:				
1. determined whether checklists were available or would need to be developed locally..................				
2. determined who would have responsibility for securing or developing the checklists (and how they would be trained, if necessary)...........				
3. established tentative assessment procedures appropriate for your CBE program, including: a. student's role in the process....				
b. instructor's role in the process.				
c. at what points assessment would be conducted....................				
d. provisions for recycling........				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
4. established a set of tentative performance standards (rating scale) appropriate for your CBE program.....				
5. considered how achievement of competencies would be translated into "grades," ensuring that the method selected was compatible with: a. the essential characteristics and desirable elements of CBE....				
b. your institution's grading system...........................				
c. student needs....................				
d. employer needs..................				
e. the limits of instructor time....				
6. determined if instructors and students would require training in using the assessment procedures, and how this training would be provided..				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience VI

OVERVIEW

Enabling Objective

Given information describing alternative CBE instructional models, determine the program features best suited to the needs and characteristics of your institution and your students.

Activity

You will be attending a large-group presentation on alternative CBE instructional models. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Selected CBE Instructional Program Descriptions," pp. 121-126.

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3f, p. 127, which relates to the CBE instructional model you will adopt at your institution.

Feedback

You will be evaluating your group's competency in developing section 3f of the plan, using the "CBE Implementation Plan Checklist: Instructional Model," pp. 129-130.

Activity

Attend a large-group presentation concerning alternative CBE instructional models. This presentation will include information about instructional concerns (rather than management concerns) and how to combine components of CBE into a single instructional system. Examples of such systems being used in educational institutions with CBE programs will be described, including the following system components:

- Identification of competencies
- Instructional materials
- Instructional approach
- Assessment of students
- Special features

The presenter(s) will provide opportunity for you to raise questions concerning these components and systems.

Optional Activity

It is suggested that you read the following information sheet concerning alternative CBE instructional models.

SELECTED CBE INSTRUCTIONAL PROGRAM DESCRIPTIONS

On the following pages are brief descriptions of four CBE instructional systems currently in use. Each of these descriptions covers the five components listed in the previous activity.

INSTITUTION	916 Vocational-Technical District White Bear Lake, Minnesota
IDENTIFICATION OF COMPETENCIES	Program competencies are identified locally; identification is the responsibility of the instructor. Input is derived from instructor's expertise, texts, current occupational information, local program advisory committee. Competencies are stated in the form of specific occupational tasks.
INSTRUCTIONAL MATERIALS	Materials are locally produced, with major responsibility that of the program instructor; support staff aids production. A standard format has been developed by 916 and is used by all 52 instructional programs. Some 5,800 "Learning Guides" are now available. Learning Guide includes enabling objectives, learning steps, resources, instruction sheets, self-checks, and performance test. Guides, in combination with supporting materials and media, became Learning Packages. Full-facility resource centers are located adjacent to appropriate classrooms and laboratories.
INSTRUCTIONAL APPROACH	Instruction is highly individualized and personalized, with a high degree of self-instruction. The instructor serves as a resource person, with relatively little group instruction. Student recycles if mastery is not attained at first attempt. Program is open-entry/open-exit; student's rate of progress is monitored, compared with standard hours established for learning each task.
ASSESSMENT OF STUDENTS	Students are assessed on each specified task. Assessment is at two levels only: "mastered," or "not mastered." The performance test used is that which is contained in the Learning Guide; criteria are known to students in advance. The number of learning hours needed to attain mastery is recorded.
SPECIAL FEATURES	There is complete integration of handicapped and special needs students in the program. The institution operates both secondary and post-secondary programs using CBE. Staff training consists of seven instructional modules in standard format.

INSTITUTION	Central Technical Community College Hastings, Nebraska
IDENTIFICATION OF COMPETENCIES	Identification of competencies is basically the responsibility of the vocational program instructor. Input and approval are given by the local craft advisory committee. The competency list is revised as needed by instructor. Occupational skills are stated in performance terms.
INSTRUCTIONAL MATERIALS	Materials are developed locally by the program instructor, with some assistance. As instructors are employed, they are trained in materials development and spend their first weeks in developing new materials or revising existing ones. A standard format is used throughout the institution; the form is that of individual color-coded sheets, including instructional guide, information sheets, and test items.
INSTRUCTIONAL APPROACH	Instruction is completely individualized. Students may enter or exit at any time. They may concentrate on learning a few specific competencies or progress through an entire program of studies. Students work strictly at their own rate, progressing to new competencies only after achieving preceding ones. Instructors work individually with students, checking work and helping to solve problems. Student interaction, field training, and clinical experience are provided as required by the competencies. Attendance is required, but time is flexible.
ASSESSMENT OF STUDENTS	Student assessment is based on stated tasks. Final determination of proficiency is derived from paper-and-pencil as well as performance tests. The instructor determines the acceptable level of performance. These are criterion-referenced, not norm-based.
SPECIAL FEATURES	"Variable Credit" concept and registration procedures allow the student complete freedom in buying credits for the competencies he/she wishes to attain; a truly self-paced and personalized learning program is possible. One-to-one teaching predominates. A high degree of student motivation permeates the instructional program.

INSTITUTION	State of Kentucky Bureau of Vocational Education
IDENTIFICATION OF COMPETENCIES	Program competencies for this state-supported system are derived directly and without change from V-TECS catalogs. All V-TECS competencies are included in the instructional program. New program development is dependent upon the availability of V-TECS catalogs. All CBE programs in the state project use the same sets of competencies.
INSTRUCTIONAL MATERIALS	Individualized modules are developed for all CBE programs by the Kentucky Bureau of Vocational Education. Selected teams of instructors work with technical support staff to write modules and develop media. Materials are produced and distributed by the state. The statewide standard format includes an activity guide, information sheets, self-checks, and performance assessment measures, all packaged in a transparent folder. Instructors receive these materials and organize their own resource centers.
INSTRUCTIONAL APPROACH	Instruction is generally individualized; the specific approach varies somewhat with instructor. Students work on a specified sequence of competencies at their own rate. Some programs are open-entry/open-exit. Provision is made for the instructor to modify learning activities to suit individual students' learning styles.
ASSESSMENT OF STUDENTS	Criterion-referenced measures are taken directly from V-TECS catalogs and are included in the modules. The instructor rates the student's performance of each competency as "acceptable" or "not acceptable." The student recycles if necessary to achieve competence. Course grades include factors of competencies achieved, attitude, employability skills.
SPECIAL FEATURES	Before the instructor receives the materials and installs a CBE program, he/she successfully completes a modularized training program conducted by the state department. Some support media and hardware are supplied by the state. The CBE approach is used in both secondary and postsecondary programs.

INSTITUTION	Holland College Prince Edward Island, Canada
IDENTIFICATION OF COMPETENCIES	A thorough application of the DACUM process is used for analyzing occupations. A DACUM committee of incumbent workers and supervisors identifies all competencies essential for local workers in the occupation. The instructor and support staff build the instructional program directly from an unmodified DACUM chart. The chart is reviewed and updated by a DACUM committee every three years.
INSTRUCTIONAL MATERIALS	Instructional materials are developed locally, using the institution-designed format. Learning guides are produced by a team including the program instructor and educational technologists. A vertical file box is provided for each competency in a program, containing a learning guide, printed support materials from a variety of sources, and locally produced media. The files are available in a resource center located right within the program classroom or laboratory. Learning guides provide skill elaborations and print, media, and human resources for achieving proficiency.
INSTRUCTIONAL APPROACH	This is a highly individualized, open-entry/open-exit program. The student and instructor determine the sequence of competencies to be achieved. Practice, drill, and group work are provided where necessary. Field training experience is arranged to provide advanced and realistic experience as needed to achieve competence. The instructor is responsible for maintaining student progress through the program.
ASSESSMENT OF STUDENTS	Students are rated on each skill attempted. A five-level rating scale differentiates student performance. The student first completes a self-assessment; then the instructor makes a rating; and then differences are resolved. Field assessment of competencies may be done by on-the-job trainer. The student may work to improve a rating at any time. Acceptable standards of performance are based on the instructor's interpretation of occupational expectations.

SPECIAL FEATURES

All instructors are involved in a continuous staff development program using the same competency-based approach as student training. The "Record of Achievement" given to the student records ratings of all program competencies.

Activity

Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   f. Instructional Model: Briefly describe the ideal CBE instructional model for your institution.

   - What procedures will be followed when a student enters the program?
   - How will students' present competency level be evaluated and validated?
   - How will individual student programs be designed?
   - How will student-instructor contact time be organized?
   - What other special instructional features will be emphasized in your CBE program?

Feedback

After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Instructional Model," pp. 129-130, to evaluate your work.

Institution ____________________

Date ____________________

CBE IMPLEMENTATION PLAN CHECKLIST: INSTRUCTIONAL MODEL

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning the CBE instructional model you will adopt at your institution, you:				
1. made decisions based on the following factors:				
a. how competencies would be identified........................				
b. what instructional materials would be used....................				
c. how students would be assessed...				
2. considered the degree of individualization to be sought.............				
3. considered any special features to be included........................				
4. developed a tentative overall instructional model that is:				
a. consistent with CBE concepts.....				
b. internally consistent...........				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
c. all-inclusive, covering how instruction will be provided to students from initial entry into the program to final exit...				
d. realistic in terms of your staff, students, and institutional mission and philosophy....				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience VII

OVERVIEW

Enabling Objective

Given information about various CBE management and administrative options, describe the options most appropriate for your institution's mode of operation.

Activity

You will be attending a large-group presentation on various CBE management and administrative options. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Managing the Competency-Based Vocational Program," pp. 133-140.

Activity

You and the other members of your assigned small group will be completing the "CBE Implementation Plan," section 3g, p. 141, which relates to how you will manage and administer CBE in your institution.

Feedback

You will be evaluating your group's competency in developing section 3g of the plan, using the "CBE Implementation Plan Checklist: Management/Administration," pp. 143-144.

Activity

Attend a large-group presentation concerning various CBE management and administrative options. This presentation will include the following topics:

- Providing a resource center
- Devising record-keeping forms and procedures
- Organizing the physical facilities
- Storing and managing student instructional materials
- Managing an individualized or open-entry/open-exit system
- Assessing student fees
- Determining faculty load

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For a written review of some of the topics covered in the above presentation, you may wish to read the following information sheet.[7]

MANAGING THE COMPETENCY-BASED VOCATIONAL PROGRAM

A vocational instructor installing a competency-based instructional system must be prepared to manage a learning situation that is quite different from that of conventional programs. Students will be engaged in many learning activities at several levels of achievement, and they will be working at varying rates. At any one moment in the instructional period, some students will need supervision of their laboratory work; one or two may want to get started working on a new learning package in the occupational series; several may have questions about the reading they are doing as part of their learning packages; one may want advice about arranging to visit a field site as an optional activity;

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[7] Adapted from The Center for Vocational Education, "Organize the Vocational Program to Install Competency-Based Instruction," **Module** K-2 (Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977), pp. 7-18.

and two students may be ready for the instructor to observe and assess their performance of a required skill.

The number of student activities and needs in an individualized competency-based education (CBE) program places heavy demands on the managerial ability of the instructor. If the instructor attempts to cope with these varied demands by reimposing a lock-step organization--in which all students begin and complete each module at the same time, with group instruction and group testing--a great deal of the value of CBE will have been lost. If the instructor uses individualization with insufficient organization, confusion and frustration will likely be the result.

The role of a successful instructor in a CBE program will be increasingly that of a learning manager, rather than a giver of information. In order to fulfill this new role, the instructor will need to know at all times (1) the status and progress of each student in the program, (2) the resources, materials, and equipment required by students in the immediate future, and (3) the problems students are likely to have with each learning package or competency as they work through the program.

Record Keeping in a CBE Program

In order to know the status and progress of each student, complete records of student achievement are required. In some CBE programs, all students will be working to complete the same designated series of competencies. Other programs will encourage each student to have a training program that is individually designed for his or her particular personal and occupational goals. In either case, an official record card should be on file for each student, showing the competencies that constitute the agreed upon program of studies. A copy of this record should be available at all times for use in counseling and advising students in their daily learning activities.

As students complete the work of each learning package and demonstrate the necessary competency, a record must immediately be made of their achievement. The record forms and record-keeping procedures do not need to be complex, but they must be more detailed than traditional classroom grading procedures and must be accurate. Above all, the instructor must be scrupulous in keeping student progress records absolutely up to date. Trusting to memory and doing record keeping in "batches" at the end of the day or the week simply will not do.

At the minimum, a current student progress record should include the following data: (1) the student's complete planned program of occupational competencies (or learning packages),

(2) the date the student began to work on any given learning package, (3) the dates when performance tests were administered, but the level of performance achieved required the student to recycle or redo parts of the learning packages, (4) the date the given learning package or competency was successfully completed, and (5) the final rating on the competency (if this is appropriate to the learning materials used). This data should be entered on the student's record sheet as soon as each event occurs. (It is convenient to carry these record sheets in a notebook so they are at hand at all times.)

Typically in a CBE program, the student's performance of a competency is rated against a checklist. After it has been completed, the checklist should be placed in the student's permanent file folder. Sample 9 is an example of a student record sheet suitable for a CBE program.

In addition to keeping an accurate record of the individual student's achievement, some instructors maintain a chart that records the progress of the total student group. It is helpful for students to know how they are progressing toward their ultimate goal--it is essential for the instructor to be able to spot individual students who may be having learning difficulties or motivation problems. Teachers report that in individualized CBE programs it is easy for a student to get "lost," as it were, making little or no progress without anyone noticing the situation. A wall-type progress chart of the kind that vocational teachers have used for many years will be very valuable in keeping student and instructor alike aware of individual achievement. The units of progress across the top of the chart should, of course, be the learning packages or competencies that constitute the occupational program. Sample 10 is an example of a progress chart that could be used in a CBE program.

It is true that, for some students in a CBE program, achievement will not take the form of a completely orderly progress from one competency to the next. Progress may be sporadic because, for example, an essential piece of equipment is in heavy use, a field experience is dependent on the season, or the student discovers some kind of personal block. It is usually permissible for students to suspend work on one competency for a while in order to move on to another. The instructor should be thoroughly aware of this, however, and get the student back in sequence as soon as he or she is ready to proceed again.

Some vocational-technical institutes and community colleges are installing computer programs for maintaining achievement records of students in competency-based occupation programs. The periodic printouts that are furnished to the instructor can be a rich source of information. They can aid in identifying students with achievement problems and reveal the need for curriculum

SAMPLE 9

COMPETENCY ACHIEVEMENT RECORD

Occupational Training Program ____________________

Student's Name ____________________

Program Beginning Date __________ Program Completed __________

Instructor ____________________

Module No.	Title	Dates		
		Started	Recycle	Achieved

SAMPLE 10

CLASS PROGRESS CHART

Class Period ______ Semester ______

	Modules								
Students	A-1	A-2	A-3	A-4	A-5	B-1	B-2	B-3	B-4
Jones	▧	▧	▧						
Smith	▨	▨	▨	▨					
Roberts	▧	▧		▧					
Ernesto	▨	▨	▨	▨					

revision. If your institution uses computer data processing, it is to your advantage to learn how to furnish it with accurate data and to interpret the resulting information output.

Organizing the Physical Facilities

Some changes in the physical organization of the vocational classroom and laboratory may be necessary to help ensure good management of the CBE program. This is in addition to the provision of a resource center, to be discussed later. You probably will not need to make many major changes, at least until you have gained a great deal more experience in using the competency-based approach.

One item that must be considered is how to store and distribute the instructional materials themselves--the learning packages (learning guides, or modules). For some occupational programs (distributive education programs using the IDECC materials, for example) this is an important problem. The learning packages can be numerous and voluminous; they need to be carefully kept in correct order and in good condition; and they must be readily available to instructor and students. Probably the best solution is to keep the stock of new, ununsed learning packages in three- or four-drawer file cabinets, stored in logical sequence, and neatly labeled. For learning packages that are currently being worked on by students in the class, you can provide cabinets or wall-hung "pigeon hole" compartments, with a space assigned to each student. It is important that students have an organized and secure place for learning packages in process, so that they don't lose or misplace their work and become discouraged. Learning packages that have been completed by students can be put into a temporary storage cabinet, ready for checking and perhaps recycling into the module stock. No matter how simple the storage equipment, good organization here is all-important because of the sheer volume of materials that must be controlled.

Another possible change in the physical setting is in the arrangement of class seating. A vocational program using the CBE approach is much less likely to need the usual rows of tablet chairs or desks facing the chalkboard--an arrangement that is best suited to group instruction. Small groupings, out of the traffic, can serve as stations for impromptu conferences between instructor and student, or study areas for students who want to refresh their memories before going on to the next laboratory activity. In a vocational subject involving considerable technical data, instructors and students might find it helpful to have small portable chalkboards available at these study spots.

In some CBE programs, it might be highly desirable to have an area in the facility set aside just for assessing the students' final performance. The assessment procedures are likely to be considerably more structured, complex, and time consuming than in conventional programs. Anything that can be done to organize the laboratory to facilitate the assessment function will be extremely helpful. For example, a business and office program would benefit from having a small semi-private area equipped with all required machines and supplies where the student could take the performance tests under the observation of the instructor. This would provide a minimum of distraction and afford the privacy that is very desirable for a frank and open discussion of the student's performance. An electronics program could set aside a bench with all the major test instruments installed and ready for use in the assessment procedures.

The Resource Center in a CBE Program

A resource center is an important and unique element of an effective competency-based vocational program. This facility (also sometimes called a learning center) may function as a library, study room, media viewing room, or counseling area, depending on the need. Working in the resource center, the vocational student might (1) select from the storage file the next learning package on his or her schedule, (2) sit at a table to read the necessary information sheet, (3) get some additional information from a reference book located on a nearby shelf, (4) locate a specific slide/tape presentation as directed in the learning package and look at it on a slide/tape projector which is set up in a carrel, and (5) fill in a worksheet or respond to some self-check items included in the learning package. During this time in the resource center, the student may be working alone or with other students. Some questions or difficulties may arise that require the assistance of the vocational teacher. After preliminary work in the resource center, the student may go out to the laboratory to work on the skill, then return for additional study if he/she runs into a problem.

All this illustrates that the vocational student in a program using the CBE approach must have convenient access to study tables, reference materials, and media materials and equipment, and needs to have the teacher available for guidance. The resource center is an area designed to provide all this and to permit the student to work at his/her own pace to complete the work required. The environment should be attractive and should be organized to encourage and support the student in the completion of the learning activities.

The demands of individual occupational programs will vary, of course, as will the amount of money the school may be able to allot to establishing and maintaining a resource center. However, here are the items you should try to include in just about any CBE resource center:

- Storage for instructional materials--There should be file cabinets for learning packages (lockable or not, depending on your management system and your students). Shelves will be needed for texts, reference books, pamphlets, and other printed matter. File boxes or storage drawers can contain slides, audio cassettes, videotapes, and film loops. All of this should be organized so as to be easily accessible and easy to maintain control.
- Study and work tables--Tables are needed for many student learning activities, including reading, writing self-check responses, practicing paper-and-pencil competencies, and planning project work. The number of study tables will vary according to the programs to be served, but a rough approximation would be seating space for at least 25 percent of the number of students in the program.
- Individual study carrels--Carrels may be purchased or made in the school shops. They should provide for the installation of media equipment, the necessary electrical wiring and outlets, adequate lighting, and shelving for reference materials. If the program's instructional materials rely heavily on media, several fully equipped carrels may be required.
- Counseling area--Some space with table and chairs should be set aside for teacher counseling. The student should be able to come to the instructor with technical problems, and they should have a relatively quiet area in which to work together.
- Media equipment--Individualized competency-based vocational programs usually involve heavy use of instructional media. The versatile slide/tape projector has become extremely popular in recent years and should now be considered a basic piece of equipment for the resource center. Cassette-type tape recorders should also be included. Now becoming widely used are videotape playback units (Betamax color cassettes are becoming the standard). Depending on your program, you may also want an 8mm film loop projector and an overhead projector. It is best to provide students with individual headphones for all audio equipment so as not to disturb others working in the area. It is probably a wise idea to start the CBE program with what is considered a minimum of equipment, with provision to quickly add more units if and when the need becomes apparent.

The resource center for a CBE vocational program may be located in one of several places within the school. It may be a part of the school's main library, under the management of the library staff. This can be efficient in terms of the purchase and control of materials, and it removes many management responsibilities from the vocational teacher. It may, however, have some disadvantages in accessibility for students and teachers alike. A central location, for example, may not be very helpful to the computer programming student who needs to ask a technical question while working in the resource center, and whose instructor is located in another wing of the building. The student coming in from working in the dairy barn or the auto mechanics laboratory to review a slide/tape may not feel particularly comfortable in plush library surroundings.

If there are a number of vocational programs using the CBE approach, the resource centers may be decentralized. There may be a resource center established, for example, for the building trades cluster, another for business and office practice, and a third for the technical programs--each located close to the appropriate classrooms and laboratories. The materials for the programs can be conveniently organized and managed by a trained aide or clerk. These subject-area resource centers can be well managed, quiet, and reasonably convenient. Of course, the student still does not have the immediate help of the instructor, but a well-versed aide can be of considerable assistance.

If it is possible, it is very desirable to have a resource center right within each program facility. It will be necessary to provide a fairly quiet and clean area, separated by some means from the more active and distracting aspects of the program. Such a resource center can be located in one corner of the vocational laboratory, in the classroom area, or in an alcove or room immediately adjacent to the laboratory. Sometimes a shop balcony is available. It can be set off from the rest of the facility by bookcases or shelving, glass dividers, or movable partitions.

The materials should be organized so students can locate what they need without trouble, and so the instructor can maintain control of the instructional materials. Putting all required materials for a particular competency into a single file box is one solution. The box can be clearly marked and shelved in proper order. Because students are acutely aware that these materials are essential to their own progress in a CBE program, there are usually few difficulties with loss.

More and more competency-based programs are locating their resource centers right in the laboratory or classroom. Even though this does place more responsibility on the instructors, they prefer this to being separated from the work of their students, as happens when a central location is used. You will probably want to work for this in your own CBE program.

Activity

Join the other members of your assigned small group, and work together to develop the following section of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   g. Management and Administration: Describe any specific management and administrative options that would be appropriate for your institution's CBE program.

   - What, if any, additional (or reorganized) facilities will be required?
   - What, if any, additional instructional or media equipment will be needed?
   - How will CBE resource centers be provided?
   - How will resource centers be managed and staffed?
   - What are the priorities among the needed resources?
   - How will instructional materials be stored, maintained, and dispensed?
   - What institutional policies need to be changed to accommodate CBE?
   - How will registration, tuition, and program completion procedures be arranged? Will the program be open-entry/open-exit?
   - How will occupational licensure requirements be affected by a time-free program?
   - How will student progress and achievement be recorded?
   - How will teaching loads and other instructor responsibilities be modified to meet the needs of CBE?
   - What new staffing requirements will there be? What staff duties need to be changed?

Feedback

After your group has completed the previous section of the implementation plan, use the "CBE Implementation Plan Checklist: Management/Administration," pp. 143-144, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: MANAGEMENT/ADMINISTRATION

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning how you will manage and administer CBE in your institution, you:				
1. determined how resource center(s) would be provided, considering:				
a. available facilities				
b. available staff				
c. available funds				
d. the actual need per program				
2. considered how physical facilities would be organized to accommodate and foster CBE				
3. determined how records and materials would be kept, including:				
a. tentative procedures				
b. where records and materials would be housed				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
c. persons responsible for developing and maintaining records and materials........................				
4. determined how the present management system could be modified (fee assessments, faculty load, awarding of credits), if necessary, to accommodate:				
a. open-entry/open-exit............				
b. self-paced rather than time-based student progress..........				
c. competency-based "grading"......				
d. increased one-on-one student-teacher contacts................				
5. ensured that all management plans were realistic and consistent with the principles of CBE...............				

Level of Performance: All items **must** receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience VIII

OVERVIEW

Enabling Objective

Given implementation guidelines, determine strategies for initiating the implementation of CBE at your institution.

Activity

You will be attending a large-group presentation on implementation guidelines. You will also have the opportunity to participate in a question-and-answer session following the presentation.

Optional Activity

You may wish to read the information sheet, "Implementing CBE: One Institution's Approach," pp. 147-154.

Activity

You and the other members of your group will be completing the "CBE Implementation Plan," sections 3h and 4, pp. 155-156, which relate to how you will initiate the implementation of CBE at your institution.

Feedback

You will be evaluating your group's competency in developing sections 3h and 4 of the plan, using the "CBE Implementation Plan Checklist: Initiating CBE," pp. 157-158.

Activity

Attend a large-group presentation concerning implementation guidelines. This presentation will include the following topics related to the start-up plans and activities required for putting a program in place:

- Finalizing the implementation strategies and techniques
- Determining who will need to be oriented and how
- Determining which programs will be involved
- Assigning responsibilities for implementation
- Setting a time line for implementation activities

The presenter(s) will provide opportunity for you to raise questions concerning these topics.

Optional Activity

For an explanation of some program development guidelines, including two models and an outline of major implementation steps to be taken, you may wish to read the following information sheet.[8]

IMPLEMENTING CBE: ONE INSTITUTION'S APPROACH

Once an analysis of the occupation has been completed, the next major task is preparing material for the program. For every skill identified on the chart, a learning package is prepared so that the program is totally individualized.

A "Program Development Grid" (sample 11) has been designed to assist in further analyzing each skill identified by industry. The grid is not designed to produce hard-and-fast specifications of learning activities. Instead, it is designed to help instructors consider the range of potential learning activities so they can respond when the need arises.

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[8] Adapted in part from Lawrence Coffin, "Competency Based Education Involving Business and Industry in Curriculum Design" (Charlottetown, Prince Edward Island, Canada: Holland College, n.d.).

SAMPLE 11

PROGRAM DEVELOPMENT GRID

SKILL									
OBJECTIVE									
LEARNING ACTIVITIES									
EQUIPMENT									
INSTALLATION OF EQUIPMENT									
HUMAN RESOURCES									
SELECTION OF PRINTED MATERIAL									
DEVELOPMENT OF PRINTED MATERIAL									
SELECTION OF A/V MATERIAL									
DEVELOPMENT OF A/V MATERIAL									
LABS									
LEARNING EQUIPMENT									

The first row on the program development grid is where the objectives for each skill are recorded. From experience, it has been discovered that writing objectives for each skill enables the instructor to give the trainee a more precise picture of what the skill involves.

After the objectives have been written, the next step is to define learning activities. This involves assessing each identified skill and selecting appropriate work-oriented activities through which the individual can gain experience and through which his or her achievements can be evaluated. In most cases, it is relatively easy to replicate industrial experiences in the learning environment for most skills identified in the occupational analysis.

The next stage in the development process is the specification of the appropriate learning environment for each skill. It is important that this be done by examining each skill and its related learning activities. Selection of the learning environment for each skill is normally a matter of deciding between the job environment and the simulated environment of the institution.

Locating and assigning human resources is a key area for a successful program. One must be sure that all skills on the chart are adequately covered by available human resources. This involves assigning instructors to teach certain skills and arranging to bring in resource persons to handle any skills that cannot be handled by the instructional team. The advisory committee frequently can assist in the identification of resource people from the community.

The next part of program development is providing learning packages for each skill. Selecting printed material is the first step normally taken and the reasons are obvious. First, there is a wealth of printed materials available for most occupations. Second, printed materials are much less expensive than other media. Third, printed materials have traditionally been a primary source of information.

Developing some printed materials may be required because available material is often geared to a higher or lower level of sophistication than is required in a particular program.

Use of audiovisual material is most desirable. Not only do such materials provide alternate modes of presentation, but they permit learners to observe and model desired performance. While students could rely on the instructor to model this performance for them, the individualization of the program will place excessive demands on instructor time if such resources are not available.

When there is a lack of suitable, commercially made audiovisual materials, it will become necessary for the instructors to develop suitable material. Certain occupations require students to be skilled in techniques in which physical performance or movement is critical. It is essential that there be provisions made for presenting such techniques in the form of formal demonstrations by skilled persons. Videotape is a most useful device for quickly recording action or performance to provide an opportunity for learners to model such a perforamnce. Normally a variety of audiovisual materials is usually the best solution to serving the needs of learners. Figures 5 and 6 show two models for developing a learning system in a CBE program.

In summary, the following major steps should be completed in the implementation of competency-based education programs. The assumption is made here that student and community surveys, etc., have already been conducted to justify the need for the programs to be implemented.

I. Identify the important competencies using one or more of the following approaches/sources:
    A. DACUM (Developing A Curriculum)
    B. V-TECS (Vocational-Technical Education Consortium of States)
    C. State or regional curriculum laboratories
    D. State department of education

II. Verify competencies
    A. Use one or more of the following groups:
        1. Occupational advisory committee
        2. Other "expert" workers and supervisors
    B. Determine the importance of each competency
    C. May involve determining the frequency of performance of each competency
    D. May involve determining which competencies are required for job entry

III. Analyze **each** verified competency
    A. Review available literature
    B. May want to involve advisory committee
    C. May want to involve experts from industry
    D. Identify the following elements:
        1. Subtasks (psychomotor) elements
        2. Cognitive (knowledge) elements
        3. Affective (attitude) elements
        4. Prerequisite skills and knowledge

FIGURE 5

DEVELOPMENT MODEL FOR DACUM LEARNING PROGRAM

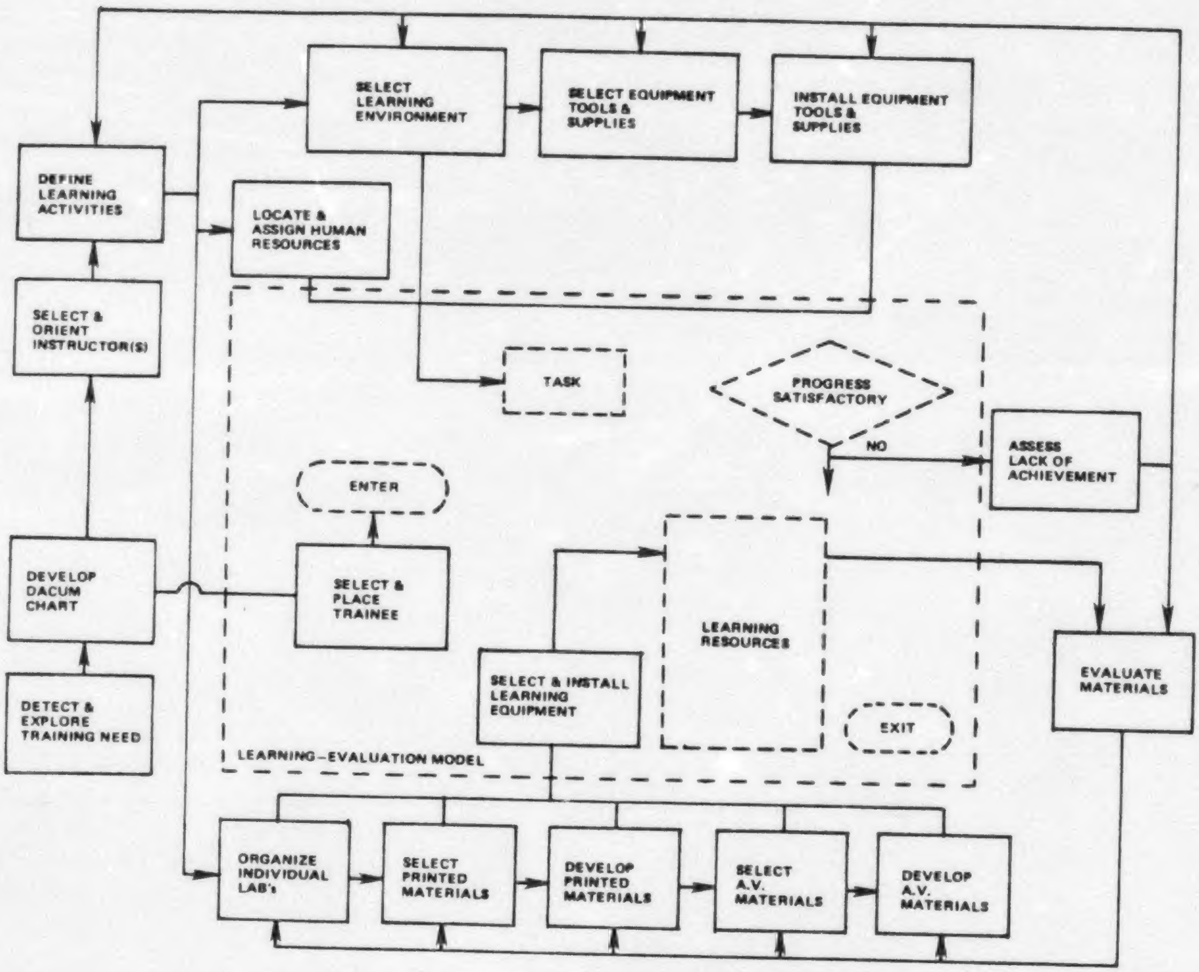
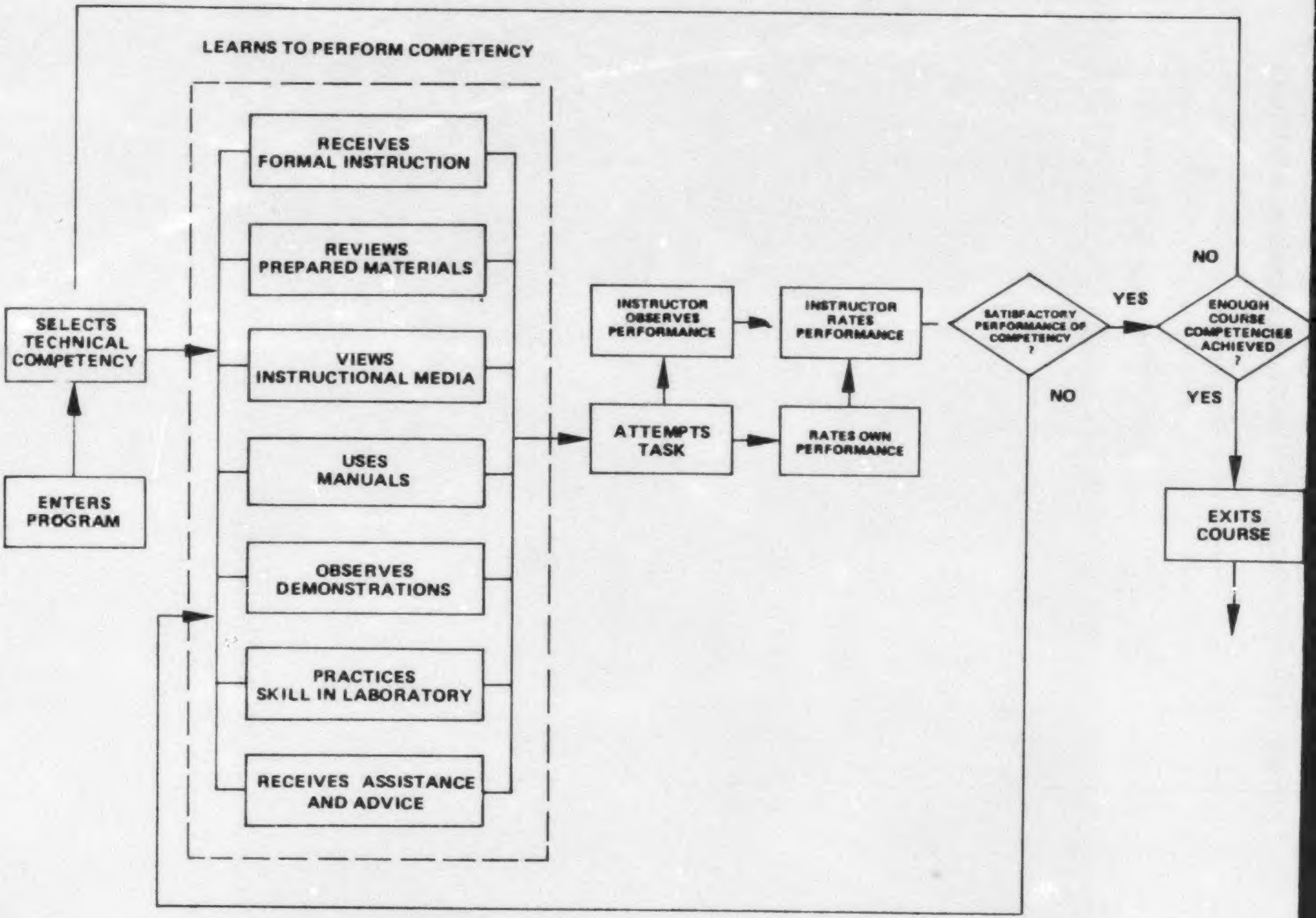

SELECT LEARNING ENVIRONMENT
SELECT EQUIPMENT TOOLS & SUPPLIES
INSTALL EQUIPMENT TOOLS & SUPPLIES
DEFINE LEARNING ACTIVITIES
LOCATE & ASSIGN HUMAN RESOURCES
SELECT & ORIENT INSTRUCTOR(S)
TASK
PROGRESS SATISFACTORY
NO
ASSESS LACK OF ACHIEVEMENT
ENTER
DEVELOP DACUM CHART
SELECT & PLACE TRAINEE
LEARNING RESOURCES
SELECT & INSTALL LEARNING EQUIPMENT
EVALUATE MATERIALS
DETECT & EXPLORE TRAINING NEED
EXIT
LEARNING-EVALUATION MODEL
ORGANIZE INDIVIDUAL LAB's
SELECT PRINTED MATERIALS
DEVELOP PRINTED MATERIALS
SELECT A.V. MATERIALS
DEVELOP A.V. MATERIALS

FIGURE 6

LEARNING-EVALUATION MODEL FOR CBE


LEARNS TO PERFORM COMPETENCY
ENTERS PROGRAM
SELECTS TECHNICAL COMPETENCY
RECEIVES FORMAL INSTRUCTION
REVIEWS PREPARED MATERIALS
VIEWS INSTRUCTIONAL MEDIA
USES MANUALS
OBSERVES DEMONSTRATIONS
PRACTICES SKILL IN LABORATORY
RECEIVES ASSISTANCE AND ADVICE
ATTEMPTS TASK
INSTRUCTOR OBSERVES PERFORMANCE
RATES OWN PERFORMANCE
INSTRUCTOR RATES PERFORMANCE
SATISFACTORY PERFORMANCE OF COMPETENCY ?
NO
YES
ENOUGH COURSE COMPETENCIES ACHIEVED ?
NO
YES
EXITS COURSE

IV. Translate each competency (task statement) into a performance objective
  A. Each objective should contain the following:
    1. Statement of performance required
    2. Statement of conditions
    3. Tentative list of evaluation criteria

V. Design instructional system
  A. Decide on degree of individualization to be used
  B. Decide on nature of learning materials to be used
  C. Determine record-keeping procedures to be used
  D. Decide on grading system
  E. Determine equipment needs, if any

VI. Develop, adapt, or select learning materials for each competency
  A. If developing materials, complete the following steps:
    1. Devise or adopt a format
    2. Draft introduction/rationale for each competency
    3. Identify enabling objectives
    4. Develop learning experiences that include:
      a. Learning activities
      b. Learning references and resources
      c. Feedback activities
    5. Devise final experience and final assessment criteria
    6. Pilot test materials
    7. Revise materials based on feedback
  B. If selecting or adapting materials, complete the following steps:
    1. Develop or adapt a materials quality checklist
    2. Review available materials using checklist
      a. Current program materials
      b. Other available materials
    3. Select best available materials or adapt as needed

VII. Prepare student orientation materials and procedures
  A. Develop student guide and/or slide/tape presentation, etc.
  B. Establish orientation procedures

VIII. Implement training program(s)
  A. Monitor activities
  B. Use technical assistance as needed

IX. Evaluate instructional program(s)
  A. Conduct formative evaluation
  B. Conduct summative evaluation

X. Modify program as needed, and continue assessment and revision
    A. Involve staff planning and/or advisory committee
    B. Use technical assistance to resolve any problems encountered

Activity

Join the other members of your assigned small group, and work together to develop the following sections of the "CBE Implementation Plan." Discuss each of the following topics and questions, and record key points and decisions made. A resource person will be available to assist you as needed.

CBE IMPLEMENTATION PLAN

3. CBE Program Components: Briefly address the following CBE program component in terms of its application to your institution's CBE implementation goals.

   h. Initiating CBE: Indicate here any specific staff development and/or technical assistance activities believed to be needed to facilitate your institution's CBE implementation goals. Consider all groups (administrators, faculty, community, etc.) and all aspects of the program (materials development/adaptation, administrative changes, record-keeping, etc.).

   - How will instructors be specially trained to install and manage CBE?
   - How can outside consultants be used to orient, train, and assist staff? to help solve administrative problems related to CBE?

4. Specific Actions/Dates: As best you can at this point, outline below the major steps/actions that will need to be accomplished to implement your proposed CBE program. Beside each step/action, indicate who (by name or job title) will (or should be) responsible for the activity, and a proposed beginning date for each activity.

Steps/Actions to Be Taken	Person(s) Responsible	Begin Date

Feedback

After your group has completed the previous sections of the implementation plan, use the "CBE Implementation Plan Checklist: Initiating CBE," pp. 157-158 to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST: INITIATING CBE

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In planning how you will initiate the implementation of CBE at your institution, you: 1. identified any training activities required to prepare staff to install and manage the CBE program, including: a. who would provide these activities........................				
b. when activities would be held....				
c. what staff would be involved.....				
2. identified other specific actions that would need to be accomplished to implement your proposed CBE program, including, for example: a. finalizing the implementation plan............................				
b. securing administrative support..				
c. orienting staff, students, and others to the program...........				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
d. promoting the program...........				
e. recruiting students into the program.........................				
f. reorganizing facilities..........				
g. reorganizing faculty load........				
h. identifying needed competencies..				
i. developing or securing instructional materials.................				
3. identified, tentatively, person(s) responsible and beginning dates for each activity above..................				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience IX

OVERVIEW

Enabling Objective

Based on the work you have completed in the first eight learning experiences, prepare a total plan for implementing a CBE program in your institution.

Activity

You and the other members of your assigned small group will be reviewing and refining the plans made in the first eight learning experiences, and compiling your work into a single tentative "CBE Implementation Plan," pp. 161-167.

Feedback

You will be evaluating your group's competency in developing a tentative CBE implementation plan for your institution, using the "CBE Implementation Plan Checklist," pp. 169-176.

Activity Join the other members of your assigned small group. Remove and compile the green "CBE Implementation Plan" sheets from learning experiences I-VIII, and work together to review and refine these plans into a total, cohesive, coordinated tentative plan. Have one person (e.g., the recorder) document this plan, using the following "CBE Implementation Plan" form.

CBE IMPLEMENTATION PLAN

1. Present Situation: Briefly outline the current status of CBE implementation efforts at your institution.
   - What specific positions have the board or administration taken in regard to CBE?
   - What, if any, programs are already totally or partially competency-based?
   - What CBE activities, if any, have been planned or conducted?

2. Desired Situation: Indicate any specific goals or objectives for the improvement of instruction that have already been established.
   - Is funding and staff available to facilitate change?
   - Are there any known constraints or concerns that may impede change? If so, what are they?

3. CBE Program Components: Briefly address each of the following CBE program component in terms of its application to your institution's CBE implementation goals.

   a. Essential Elements and Desirable Characteristics of CBE: Review the five essential elements of CBE and the associated desirable characteristics.

      - Can your institution accept each of these CBE features?
      - What, if any, features would have to be deleted or modified for your institute? Why? What implications does this have for the quality of your CBE program?

   b. Competency Identification and/or Verification: Indicate clearly how the identification and/or verification of occupational **competencies** should be handled in your institution.

      - Will you verify locally competencies developed elsewhere?
      - Will you identify competencies locally?
      - What process will you use?

c. CBE Instructional Materials/Media: Indicate how CBE materials will be provided in your institution.

- Will materials be developed or purchased or both?
- Will a common materials' format be recommended?
- What major criteria will be used in judging the quality of materials?
- If materials are to be developed, how will the production of materials be organized? Who will develop the materials? How will their work be supported (training, funds, time)? How will the materials be produced, reproduced, and paid for?
- If materials are to be purchased, how will outside sources be identified, evaluated, and selected? Will these materials be adapted or used as is? How will the purchase costs be covered?

d. Instructor/Student Role Orientation: Describe how the instructors/teachers and students in your institution will be oriented to their new roles.

- How can the cooperation of these persons best be obtained?
- What orientation activities will be conducted?
- What orientation materials will be used? How will they be developed/obtained?

e. Assessment Procedures: Briefly describe the appropriate CBE evaluation instruments and grading procedures for your institution.

- What types and levels of assessment are needed?
- What types of instruments will be used? Will they be developed in-house or obtained from outside resources? What sources?
- What assessment procedures will be used?
- What performance standards will be set?
- What are the roles of the instructor, student, and administrator in assessment?
- How will grades for completed modules and for courses be determined?

f. Instructional Model: Briefly describe the ideal CBE instructional model for your institution.

- What procedures will be followed when a student enters the program?
- How will students' present competency level be evaluated and validated?
- How will individual student programs be designed?
- How will student-instructor contact time be organized?
- What other special instructional features will be emphasized in your CBE program?

g. Management and Administration: Describe any specific management and administrative options that would be appropriate for your institution's CBE program.

- What, if any, additional (or reorganized) facilities will be required?
- What, if any, additional instructional or media equipment will be needed?
- How will CBE resource centers be provided?
- How will resource centers be managed and staffed?
- What are the priorities among the needed resources?
- How will instructional materials be stored, maintained, and dispensed?
- What institutional policies need to be changed to accommodate CBE?
- How will **registration**, tuition, and program completion procedures be arranged? Will the program be open-entry/open-exit?
- How will occupational licensure requirements be affected by a time-free program?
- How will student progress and achievement be recorded?
- How will teaching loads and other instructor responsibilities be modified to meet the needs of CBE?
- What new staffing requirements will there be? What staff duties need to be changed?

h. Initiating CBE: Indicate here any specific staff development and/or technical assistance activities believed to be needed to facilitate your institution's CBE implementation goals. Consider all groups (administrators, faculty, community, etc.) and all aspects of the program (materials development/adaptation, administrative changes, record-keeping, etc.).

- How will instructors be specially trained to install and manage CBE?
- How can outside consultants be used to orient, train, and assist staff? to **help solve** administrative problems related to CBE?

4. Specific Actions/Dates: As best you can at this point, outline below the major steps/actions that will need to be accomplished to implement your proposed CBE program. Beside each step/action, indicate who (by name or job title) will (or should be) responsible for the activity, and a proposed beginning date for each activity.

Steps/Actions to Be Taken	Person(s) Responsible	Begin Date

Feedback

After your group has completed the tentative implementation plan, use the "CBE Implementation Checklist," pp. 169-176, to evaluate your work.

Institution ______________________

Date ______________________

CBE IMPLEMENTATION PLAN CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL column to indicate that **each of** the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column.

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
In describing your institution's current status and desired situation concerning CBE, you: 1. were able to identify how the board and administration regard CBE........				
2. described CBE programs and activities already planned or underway.....				
3. were able to identify funds available to implement CBE...............				
4. were able to identify staff available to implement CBE...............				
5. were able to identify known constraints or concerns.................				
6. noted any CBE features that would have to be deleted or modified for your institution....................				
7. considered carefully how these deletions or modifications would affect the quality of your CBE program......				

In planning how you will handle the competency identification process in your institution, you:

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
8. decided whether to identify competencies locally or to verify locally competencies developed elsewhere............................				
9. made your decision based on:				
a. the competency identification system currently in use in your institution......................				
b. competency lists prepared within your state for your use (e.g., by the state department)........				
c. competency lists available for your specific vocational/technical programs....................				
d. budget available................				
10. decided what process to use in identifying/verifying competencies (e.g., conventional, DACUM).........				
11. decided who would be involved in the identification/verification process (e.g., staff, advisory committees)...				

In planning how you will provide CBE materials in your institution, you:

	N/A	NO	PARTIAL	FULL
12. decided whether to secure materials elsewhere or develop them locally....				
13. made your decision based on:				
a. the instructional materials currently available in your institution..........................				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
b. CBE materials prepared within your state for your use..........				
c. CBE materials available for your specific vocational/technical programs........................				
d. budget available for development.				
e. staff available for development..				
14. decided on the development process to be used, if materials are to be developed locally, including:				
a. how staff will be trained........				
b. how staff will be provided with the development time required....				
c. general format to be used........				
d. media to be included, if any.....				
e. criteria for evaluating materials...........................				
In planning how you will orient students and instructional staff at your institution to CBE, you:				
15. considered their current level of awareness concerning CBE............				
16. tentatively outlined strategies and techniques to be used in the orientation process, including those designed to orient students and instructional staff to:				
a. characteristics of CBE...........				
b. their changing roles in a CBE program.........................				
c. your specific CBE program........				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
d. CBE instructional materials				
e. CBE facilities				
f. CBE process				
17. identified persons who could conduct the orientation process				
18. identified materials needed for the orientation process and how they would be obtained				
19. considered staff and budget limitations in making your plans				
In planning the CBE assessment procedures you will use in your institution, you: 20. determined whether checklists were available or would need to be developed locally				
21. determined who would have responsibility for securing or developing the checklists (and how they would be trained, if necessary)				
22. established tentative assessment procedures appropriate for your CBE program, including: a. student's role in the process				
b. instructor's role in the process				
c. at what points assessment would be conducted				
d. provisions for recycling				
23. established a set of tentative performance standards (racing scale) appropriate for your CBE program				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
24. considered how achievement of competencies would be translated into "grades," ensuring that the method selected was compatible with: a. the essential characteristics and desirable elements of CBE....				
b. your institution's grading system............................				
c. student needs....................				
d. employer needs...................				
e. the limits of instructor time....				
25. determined if instructors and students would require training in using the assessment procedures, and how this training would be provided..				
In planning the CBE instructional model you will adopt at your institution, you: 26. made decisions based on the following factors: a. how competencies would be identified.......................				
b. what instructional materials would be used....................				
c. how students would be assessed...				
27. considered the degree of individualization to be sought.............				
28. considered any special features to be included.........................				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
29. developed a tentative overall instructional model that is:				
a. consistent with CBE concepts.....				
b. internally consistent...........				
c. all-inclusive, covering how instruction will be provided to students from initial entry into the program to final exit...				
d. realistic in terms of your staff, students, and institutional mission and philosophy....				
In planning how you will manage and administer CBE in your institution, you:				
30. determined how resource center(s) would be provided, considering:				
a. available facilities............				
b. available staff.................				
c. available funds.................				
d. the actual need per program......				
31. considered how physical facilities would be organized to accommodate and foster CBE......................				
32. determined how records and materials would be kept, including:				
a. tentative procedures............				
b. where records and materials would be housed.................				
c. persons responsible for developing and maintaining records and materials......................				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
33. determined how the present management system could be modified (fee assessments, faculty load, awarding of credits), if necessary, to accommodate: a. open-entry/open-exit............				
b. self-paced rather than time-based student progress..........				
c. competency-based "grading".......				
d. increased one-on-one student-teacher contacts................				
34. ensured that all management plans were realistic and consistent with the principles of CBE...............				
In planning how you will initiate the implementation of CBE at your institution, you: 35. identified any training activities required to prepare staff to install and manage the CBE program, including: a. who would provide these activities......................				
b. when activities would be held....				
c. what staff would be involved.....				
36. identified other specific actions that would need to be accomplished to implement your proposed CBE program, including, for example: a. finalizing the implementation plan..........................				
b. securing administrative support..				

	LEVEL OF PERFORMANCE			
	N/A	NO	PARTIAL	FULL
c. orienting staff, students, and others to the program...........				
d. promoting the program...........				
e. recruiting students into the program.........................				
f. reorganizing facilities..........				
g. reorganizing faculty load........				
h. identifying needed competencies..				
i. developing or securing instructional materials.................				
37. identified, tentatively, person(s) responsible and beginning dates for each activity above..................				

Level of Performance: All items must receive FULL, or N/A responses. If any item receives a NO, or PARTIAL response, revise your plan accordingly.

Learning Experience X

OVERVIEW

Enabling Objective

Given that the workshop is drawing to a close, complete a workshop evaluation form and any other remaining tasks, and submit a copy of your small group's institutional CBE implementation plan to a resource person.

Activity

You will be participating in a large-group session during which you may raise any questions you have that are still unanswered.

Activity

You will be submitting a copy of your small group's institutional CBE implementation plan to a resource person.

Feedback

You will be providing the workshop staff with feedback on your overall workshop experience by completing a workshop evaluation form.

HAVE A SAFE TRIP HOME, AND GOOD LUCK IN COMPLETING THE FINAL EXPERIENCE OF THIS WORKSHOP MODULE.

Learning Experience XI

FINAL EXPERIENCE

Terminal Objective

Within your own institution, develop and implement a competency-based education (CBE) instructional program.

Activity

After completing the workshop activities and returning to your own institution, develop and implement a CBE instructional program. This will include--

- finalizing your CBE implementation plan
- obtaining the necessary support for your program
- initiating the CBE implementation plan
- obtaining feedback and refining the CBE implementation plan accordingly

Feedback

Your total competency will be assessed by you, using the "Program Developer Performance Assessment Form," pp. 181-182.

Based upon the criteria specified in this assessment instrument, you will determine whether you are competent in developing and implementing a CBE instructional program.

PROGRAM DEVELOPER PERFORMANCE ASSESSMENT FORM

Develop and Implement a Competency-Based
Education Program (CBE-1)

Directions: Indicate the level of your accomplishment by placing an X in the appropriate column under the LEVEL OF PERFORMANCE heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A column instead.

	LEVEL OF PERFORMANCE					
In developing and implementing a CBE program, you:	N/A	NONE	POOR	FAIR	GOOD	EXCELLENT
1. made a final determination of the basic characteristics of your program plan						
2. got commitments from the groups or individuals whose support is necessary for funding and implementing the program						
3. planned and conducted orientation/training sessions for staff and others involved in implementing the program						
4. made a final determination as to which competencies or other bases would provide structure for the program						
5. located or developed, and obtained the necessary instructional materials to be used in implementing your program						

	LEVEL OF PERFORMANCE					
	N/A	NONE	POOR	FAIR	GOOD	EXCELLENT
6. implemented any management systems as identified in your plan (e.g., staffing, record keeping, scheduling, etc.)						
7. arranged for any necessary facilities and equipment (e.g., resource center[s])						
8. monitored implementation progress to determine modifications and revisions needed in the CBE program						

Level of Performance: All items must receive N/A, GOOD, or EXCELLENT responses. If any item receives a NONE, POOR or FAIR response, discuss this with other institutional staff, and in keeping with the competency-based concept, if necessary, do it again until it works!

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